NOTICE

All drawings located at the end of the document.

EG&G ROCKY FLATS

ENVIRONMENTAL MANAGEMENT DEPARTMENT

ASSESSMENT OF KNOWN, SUSPECT, AND POTENTIAL ENVIRONMENTAL RELEASES OF POLYCHLORINATED BIPHENYLS (PCBs)

PRELIMINARY ASSESSMENT/SITE DESCRIPTION

October 1991

EG&G ROCKY FLATS

ENVIRONMENTAL MANAGEMENT DEPARTMENT

ASSESSMENT OF KNOWN, SUSPECT, AND POTENTIAL ENVIRONMENTAL RELEASES OF POLYCHLORINATED BIPHENYLS (PCBs)

PRELIMINARY ASSESSMENT/SITE DESCRIPTION

October 1991

TABLE OF CONTENTS

INDEX

		Page
Section 1	INTRODUCTION	1-1
Section 2	BACKGROUND	2-1
Section 3	SITE DESCRIPTIONS AND PRIORITIZATION CATEGORIES	3-1
Section 4	POTENTIAL FATE AND TRANSPORT OF PCBs	4-1
Section 5	PROPOSED ACTIONS AND SCHEDULE	5-1
Section 6	REFERENCES	6-1
RFP Map-PCB Sites	INSERT	

1 0 INTRODUCTION

This document presents a preliminary assessment plan for identification of known, suspect, and potential polychlorinated biphenyl (PCB) contaminated sites at the Rocky Flats Plant (RFP) This assessment plan defines PCB sites based on the following

Document/records review,

Personnel discussions, and

Sampling and analysis

Based on the above, 35 sites have been identified Although only some sites have had reported releases, all PCB sites that have been identified are being considered regardless of the evidence available A narrative description of the 35 sites is presented in Section 3 with accompanying photographs In addition, each site has been categorized I, II or III based on the criteria referenced in Section 3

The Environmental Management Department initiated a limited sampling and analysis program in June 1991 to verify the presence or absence of PCB contamination from the 35 sites All sampling is completed, and lab analysis is currently in process PCBs have been reported at two sites from previous investigations, Building 707 area and Sediment Sampling Location 124 Building 707 structural components (roof, transformer pad, drain) are being managed under the Toxic Substances Control Act (TSCA) A corrective action plan has been prepared and implemented Sediment Sampling Location 124 was sampled extensively in the month of May for PCBs and plutonium (Pu) The sample results from this site indicated PCB contamination

If PCBs are determined to be present based on analytical data or other definitive information, EG&G will notify the Department of Energy/Rocky Flats Office (DOE/RFO) that there has been a historical release/spill The appropriate information will also be incorporated into the Historical Release Report (HRR), an Interagency Agreement (IAG) deliverable DOE/RFO is required to notify the Environmental Protection Agency (EPA) and Colorado Department of Health (CDH) in accordance with the IAG requirements that a historical release/spill has been identified in the event sampling results from any of the 33 sites indicate PCB contamination Identification of additional PCB sites, including analysis, and the analysis from the existing 35 sites will be presented in later reports currently in progress, and will be the framework for an eventual RCRA Facility Investigation/Remedial Investigation (RFI/RI) All sites that are determined to have PCB contamination that are not currently identified as an Individual Hazardous Substance Site (IHSS) will be proposed to be incorporated into the IAG for additional characterization and remediation

2 0 BACKGROUND

In January 1991, EG&G Rocky Flats discovered a potential oil leak in the vicinity of transformer 707-1 on the roof of Building 707 Subsequent to discovery of the oil leak, limited samples were collected from the transformer, roof, and nearby soils to verify the presence or absence of PCB contamination The sample results showed that PCBs were present at all three locations In March 1991, a more extensive characterization effort was initiated in relation to the building roof, and soils adjacent to the drain from the roof

Once PCBs were determined to be present as a result of an historical release from the vicinity of transformer 707-1, a corrective action plan was developed for Building 707 and additional investigations were initiated

A preliminary search of RFP files/documents and discussions with plant personnel from various Departments indicated an additional 33 sites A more thorough file search is currently in progress to further assess additional potential PCB sites

The Department of Energy/Rocky Flats Office was notified Feburary 1991 that there has been a historical PCB release from Building 707 and a draft letter was provided to DOE/RFO for submission to the EPA and CDH in accordance with the Interagency Agreement (IAG) notification requirements

3 0 SITE DESCRIPTIONS AND PRIORITIZATION CATEGORIES OF AREAS SUSPECTED TO BE POTENTIALLY CONTAMINATED WITH PCBs

The following site descriptions are obtained from communications with EG&G employees and site inspections All reported areas that have been potentially contaminated with polychlorinated biphenyls (PCBs) are plotted on Plate 1. Photographs have been taken of most of the sites The photographs are included with the individual site descriptions

The sites have been prioritized based on the level of threat presented to the environment. The prioritization categories are listed below

Category I

Known releases These sites have had PCB releases as indicated by analytical data for that site and /or remediation of a site due to a release

Category II

Suspected releases These sites have documentation of a release as indicated in RFP files, employee interviews, or indication of staining at the sites. No quantitative information exist or have been found for these sites

Category III

Potential releases These are all other PCB sites where there is no known releases There is no known documentation or indication through interviews with plant personnel that releases have occurred

SITE #1 - Near Present Landfill

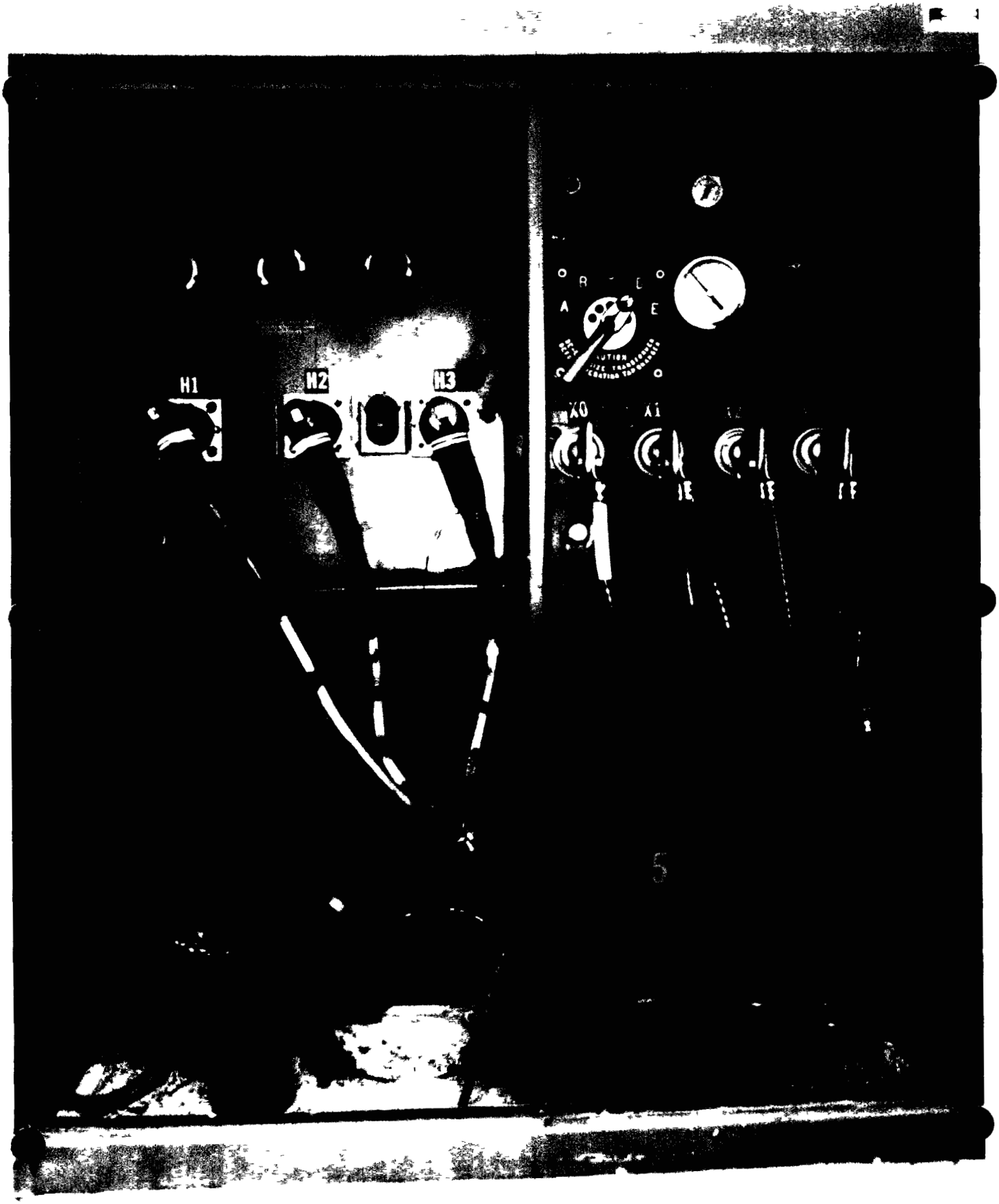
A spill of oil containing PCBs occurred in the southwestern corner of the landfill area (Photo #1) during 1987 according to an interview with personnel from Waste Management. Records are currently being researched to substantiate this account. Fifty five gallon drum containers holding PCB dielectric oil was drained from either retro-filled transformers or electro beam welders and stored in this area An unspecified amount of soil was excavated soon after the presumed spill as an effort to remediate the release The disposition of the soil from this site is not known, thus the fate of the constituents from the excavated soil cannot be determined at this time However, continuing efforts are being pursued to locate this information and assess all available analytical data This site exists within IHSS 203, which is a gravel covered pad approximately 100 by 150 feet in area

Site #1 is prioritized as a Category I

SITE #2 - Adjacent to Building 549 and 223

Two transformers (223-1 and 223-2) are currently operating at this location (Photo #2) According to an interview with EG&G plant personnel (Utilities) these transformers once leaked small amounts of oil prior to 1987 The transformers are set on concrete pads with a concrete berm surrounding each Approximately six inches of gravel fill covers the soil around the pads The transformers are believed to have been retro-filled with a non-PCB cooling oil in 1987. Previous sample analysis indicate that PCB levels were below 50 parts per million (ppm) in the oil present in the transformers at the time they were retro-filled This site is located within IHSS 117 1 and is adjacent to Building 549 and 223

Site #2 is prioritized as a Category II


H1
H2
H3

SITE #3 - Northeast of Building 551

Transformer T556 exists at this location on a concrete pad 20 feet east of building 551 within a bermed pad. The pad was constructed over an area on which a different transformer with no pad was located Transformer T556 was retro-filled in 1987 This transformer is known to have leaked oil containing PCBs directly onto the soil beneath it according to discussions with personnel from Utilities (Photo #3) No documented remedial measures were initiated at this site Transformer T556 continues to leak as evidenced by the stains on the pad in place and fresh oil present inside the east panel This site is approximately forty feet south of IHSS 158, approximately forty feet west of IHSS 117 2 and adjacent to the northeast corner of Building 551.

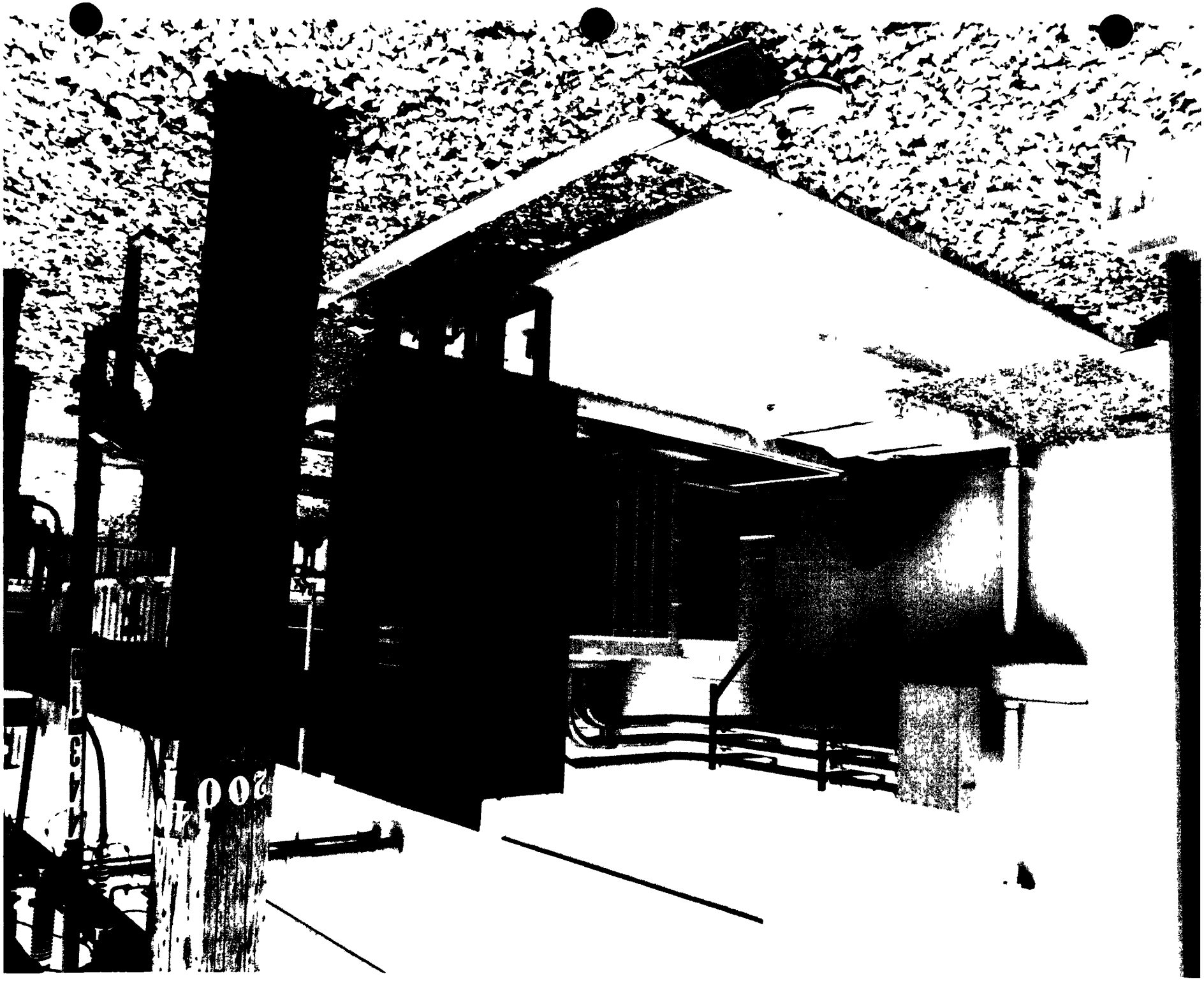
Site #3 is prioritized as a Category II

480 VOLTS
3Ø

SITE #4 - Northwest of Building 334

Transformer 334-1 is presently located at this site (Photo #4) Past records kept by Utilities Electric indicate that Transformer 334-1 has had several prior locations The transformer is situated on a concrete pad surrounded by 5 inches of gravel fill A concrete berm is located around the pad Transformer 334-1 was moved from another location prior to 1987, when it was retro-filled with non-PCB cooling oil. No spill or leak is known to have occurred at this location. The site is approximately 115 feet southwest of IHSS 181, 125 feet east of IHSS 156 1, 365 feet north of IHSS 190, and 360 feet northeast of IHSS 191 and is adjacent to the northwest corner of Building 334

Site #4 is prioritized as a Category III.



SITE #5 - Northeast corner of Building 334

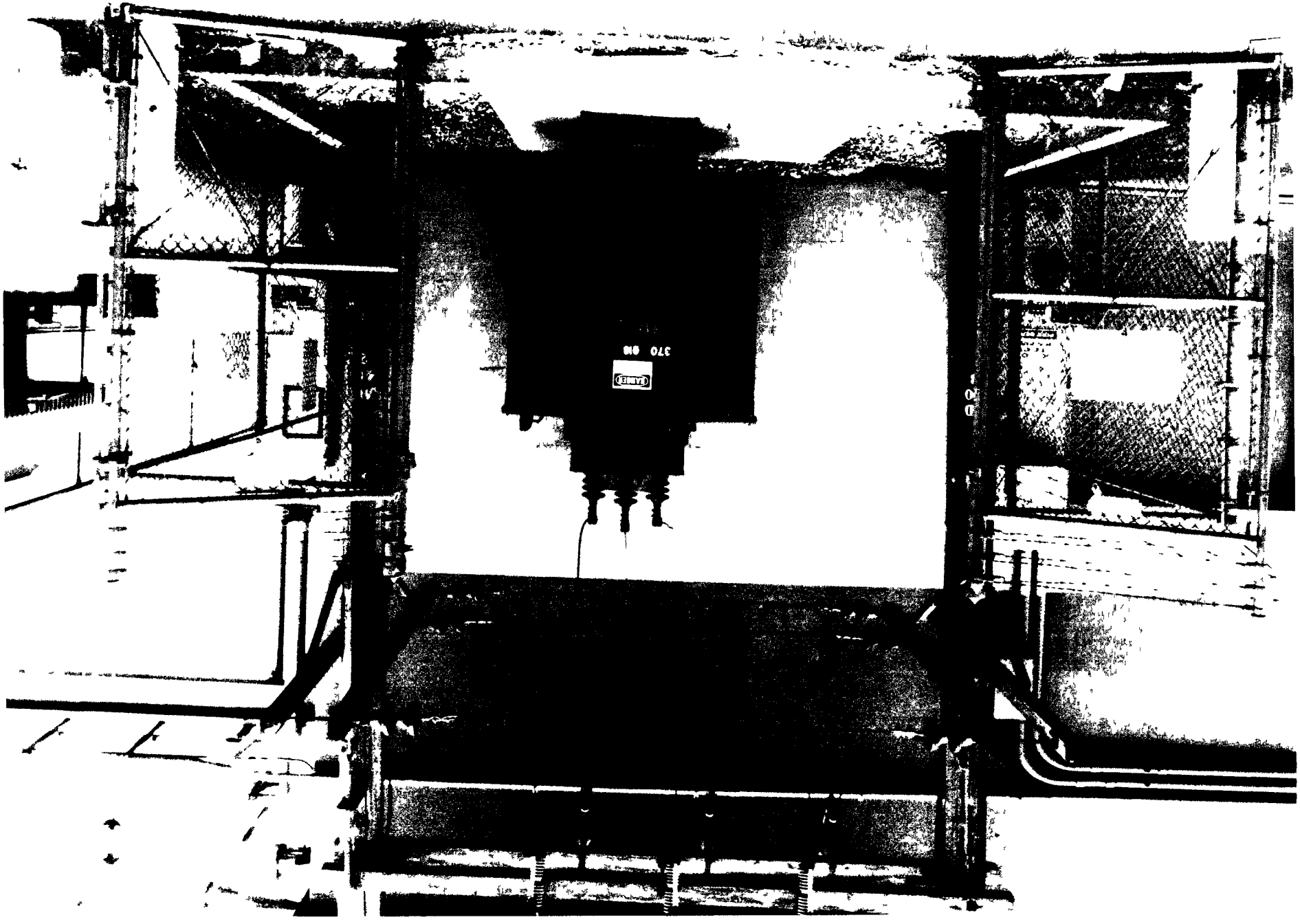
Transformer 443-1 is located at this site on a new pad constructed several feet south of its previous location on an older pad (Photo #5) A concrete berm at ground level surrounds the old and new site There is a second concrete berm surrounding the new site Transformer 443-1 replaces a former leaking transformer, according to an interview with EG&G Utilities, and was removed from the plant in 1987 This site is approximately fifty feet west of IHSS 157 1 and 115 feet southwest of IHSS 191 The site is adjacent to the northeast corner of the steam plant (Bldg.334)

Site #5 is prioritized as a Category II

SITE #6 - Basement of Building 111

This site consists of a transformer located in the basement of building 111 and has been documented as having leaked prior to 1987 The disposition of transformer oil, possibly contaminated with PCBs, is not known at this time An effort is being pursued to locate documentation pertinent to this matter There are records on file indicating that a drain system was in place within the bermed transformer pad in 1987 The drain is connected to an outside sump which has been sampled according to EG&G, Waste Management personnel The drain was sealed in 1987 and is no longer a threat to the environment. There is no photograph of this site at present Additional information on this site is currently being gathered

Site #6 is prioritized as a Category II



SITE #7 - Northwest of Building 444

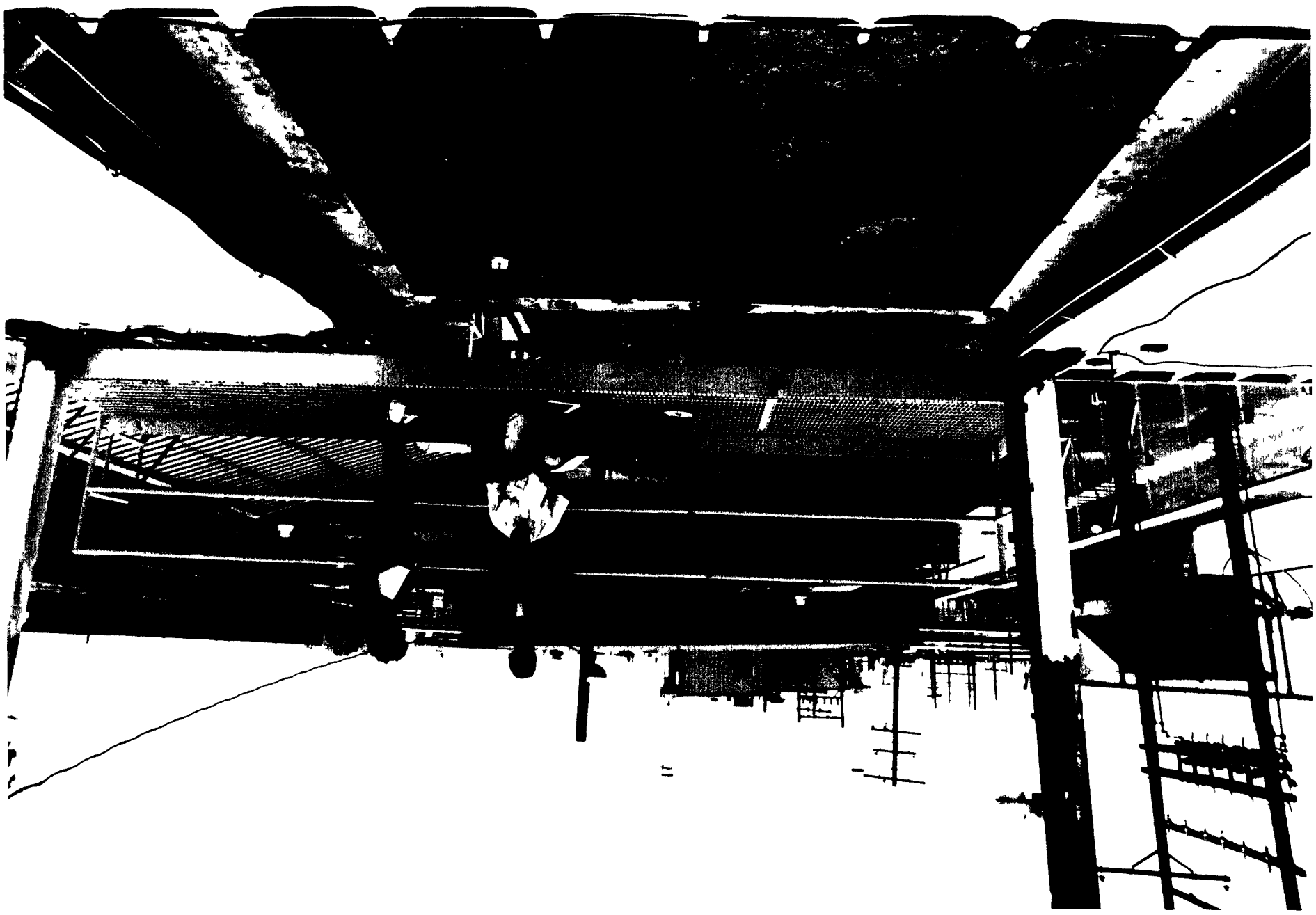
Transformer 444-2 is situated on a concrete pad at this location (Photo #7) The pad is located adjacent to the northwest corner of Building 444 and is located in a bermed area containing rock fill Currently, there is no information regarding the history of this transformer pertaining to any leaks or spills However, documentation exists that indicate the transformer contains PCB cooling oil There are no stains on the pad and no visible evidence on the surrounding gravel. This site is located forty feet north of IHSS 157 2 and approximately 165 feet northeast of IHSS 136 2.

Site #7 is prioritized as a Category III

SITE #8 - Basement of Building 444

This site is located in the basement of Building 444 (Photos #8A & 8B) Ther are three drains in the area of the documented spill One drain has been cemented over The drains are service entrance drains for conduit repair, measuring approximately 3' x 3' They are connected to a sump not piped to the outside The sump is constructed of concrete, but it is not known if there is a concrete bottom There are no berms in the area. The floor is painted with epoxy This information was gathered during an interview with Utilities personnel Further information is currently being gathered for this site

Site #8 is prioritized as a Category II



SITE #9 - Roof of Building 447

This site is an area which may have been impacted by surface water runoff contaminated with PCBs A transformer pad is located on the roof of Building 447 (Photo #9) and appears to have had a berm around it. A downspout is located north of the transformer pad There is a storm drain near dock 210 approximately twenty feet from the building. The transformer is believed to have leaked prior to its removal in 1987 according to an interview with personnel from EG&G Utilities Discharge from the roof may have contaminated roof areas and the ground as well as existing storm/sewer drains Documentation is under review to address which transformer was present at this site prior to removal The site is located within IHSS 157 2

Site #9 is prioritized as a Category II.

SITE #10 - North of 555-558 Substation

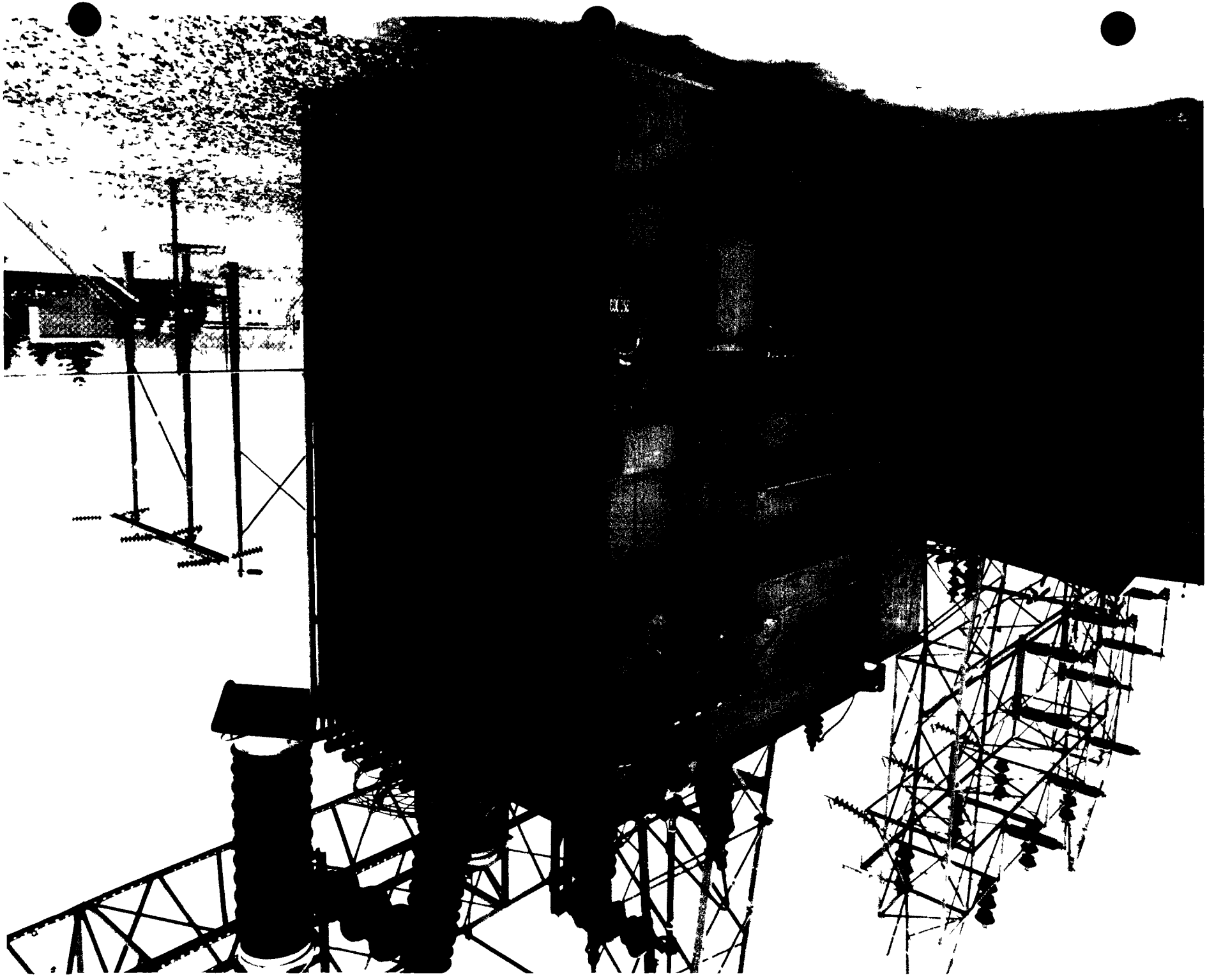
A valve on the east side of transformer 558 at this location (Photo #10) currently shows evidence of a leak around the valve These observations were made during a site visit by EG&G/EMD personnel The transformer is on the north side of 555-558 substation, and is located approximately 145 feet north of Central Avenue It is not currently known whether this transformer was ever retro-filled as part of the 1987 program. The transformer is currently active and is situated on a concrete pad There is no berm at this location IHSS 172 (Central Avenue) is located approximately 145 feet to the south, and IHSS 190, which parallels Central Avenue, is located approximately 200 feet to the south

Site #10 is prioritized as a Category II.

SITE #11 - South of 555-558 Substation

Transformer 555 is located on the south side of the 555-558 substation described in the site #10 site description This transformer shows no evidence of leaking (Photo #11), and is believed to have been retro-filled in 1987. There is no berm or drains in the area. Rock fill was utilized around the pad The transformer is active, and is situated on a concrete pad. The transformer is located approximately 25 feet north of IHSS 172 and 70 feet north of IHSS 190

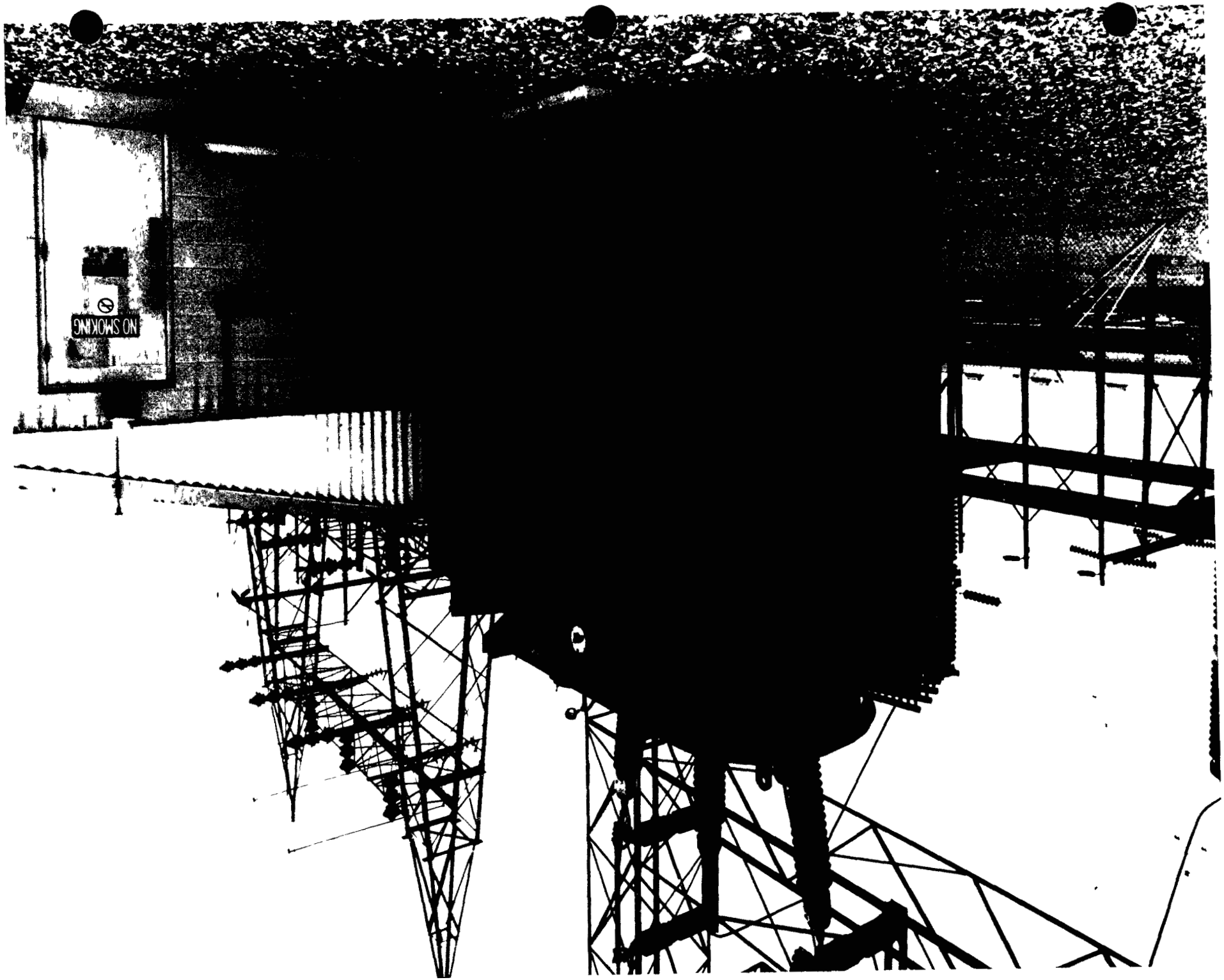
Site #11 is prioritized as a Category III



SITE #12 - North of Substation 661-675

The transformer at this site (350 002) shows visible evidence of a leak from a valve on the north side (Photo #12) There are no berms or drains in the area Rock fill was used in the area of the pad. It is unclear whether this transformer has been retro-filled The transformer is active, and is situated on a concrete pad IHSS 172 (Central Avenue) is 50 feet north of this site EG&G/EMD inspected this site in June 1991

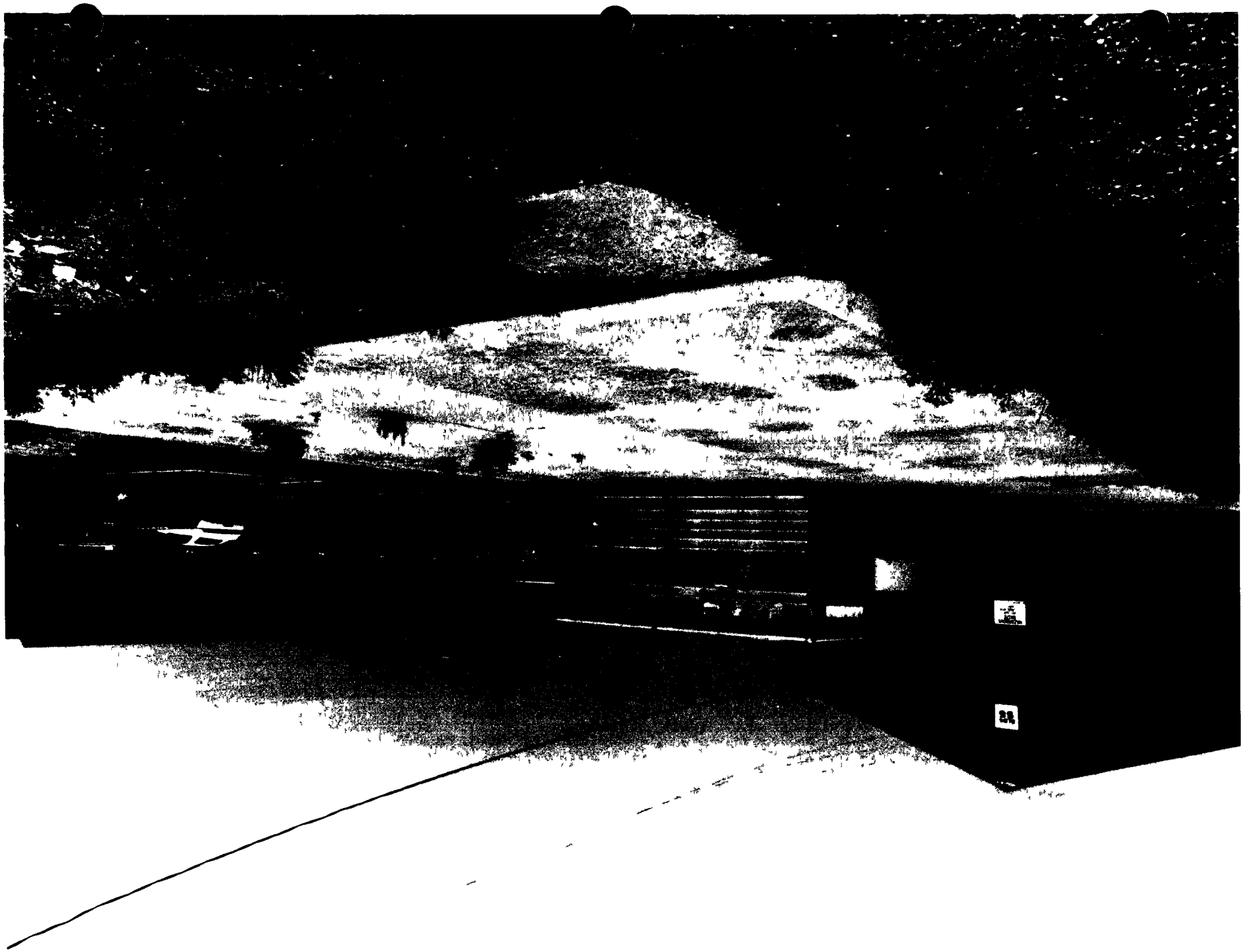
Site #12 is prioritized as a Category II


NO SMOKING

SITE #13 - South of 661-675 Substation

The transformer located at this site (350 004) shows no evidence of current leaking (Photo #13) Historical records indicate that the transformer leaked prior to 1987 according to conversations with Utilities personnel The cooling oil was sampled in 1987 after retro-filling was complete and the results were below 50 ppm The transformer is currently active and is situated on a concrete pad several feet south of the 661-675 substation There are no drains in the area or berm around the pad There is rock fill around the transformer area

Site #13 is prioritized as a Category II



SITE #14 - Adjacent to Building 666

This site is a concrete pad that was used to store unused and/or unusable transformers There are no transformers being stored at this location currently (Photo #14) There is PCB storage in Building 666 in a contained bermed basin There is no evidence of berms at the old transformer pad or fill in the area According to interviews with EG&G Utilities, numerous spills have occurred at this site in the past Document research is being conducted to track inventory at this site The site is located approximately 300 feet south of IHSS 121 (Process Waste Line)

Site #14 is prioritized as a Category II

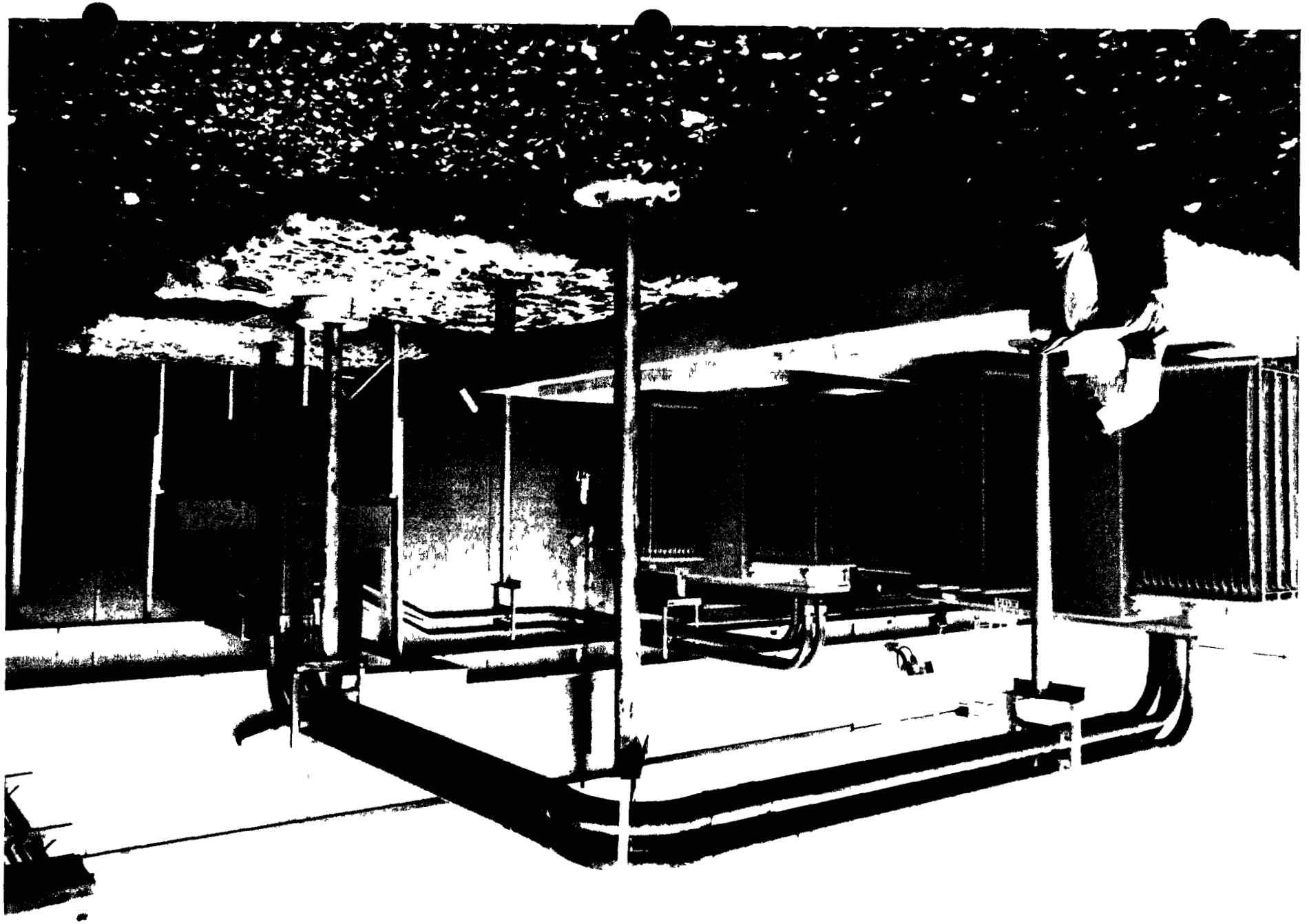
DANGER
HIGH
VOLTAGE

SITE #15 - Building 883 Drum Storage Area

This site is located within the 800 complex building area (Photo #15A & 15B) There are three transformers and one switch gear apparatus at this site All of the transformers and the gear apparatus may have leaked oil containing PCBs prior to the 1987 retro-fill operation according to an interview with Utilities personnel One of the three transformers shows evidence of leaking as indicated by visible oil stains at the valve All transformers and the switch gear are currently active The area is located 100 feet south of Building 889, and within IHSS 180 (Building 883 Drum Storage Area) The area is bermed and rock and gravel are placed as fill inside and outside of the berms There are no drains in the vicinity of the site

Site 15 is prioritized as a Category II

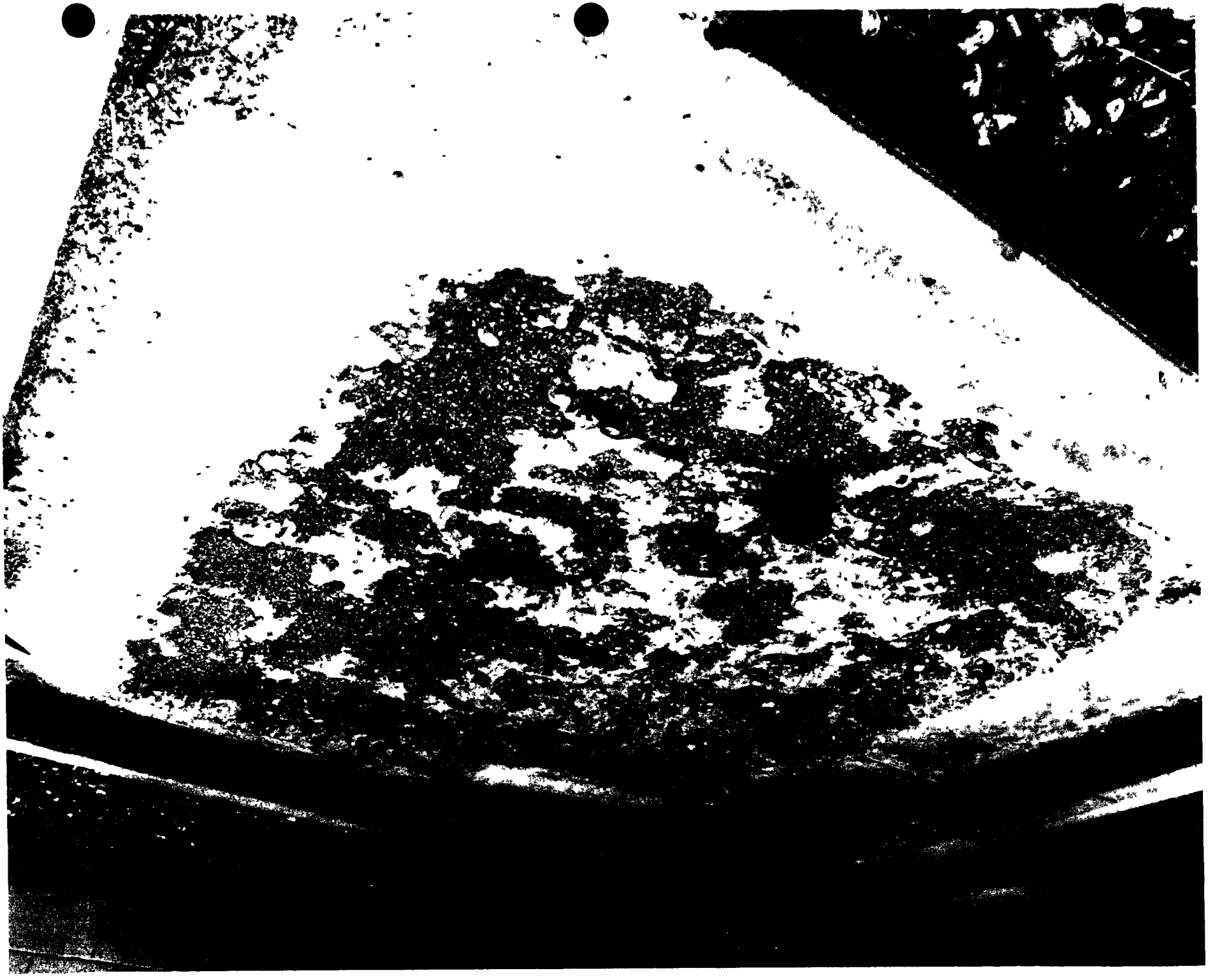
DANGER
HIGH
VOLTAGE



SITE #16 - North of Building 886

This site consists of two previous transformer concrete pads which have been partially removed (Photo # 16) The disposition, and consequently fate of constituents is not known at this time relative to the concrete material An effort is being pursued to locate this information Both of the transformers that were located on these pads (865-1, 865-2) have leaked in the past according to an interview with Utilities personnel The transformers were removed from the pads, retro-filled, and placed on new pads several feet to the north in 1987 The site is located within the 800 area, 25 feet north of Building 886 and 30 feet west of Building 865; IHSS 179 (Building 865 Drum Storage Area) is located 30 feet east of the sampling area The new site has berms surrounding the transformer area It cannot be determined visually whether the old system had berms around it There are no drains in the area The site has rock fill surrounding the transformer

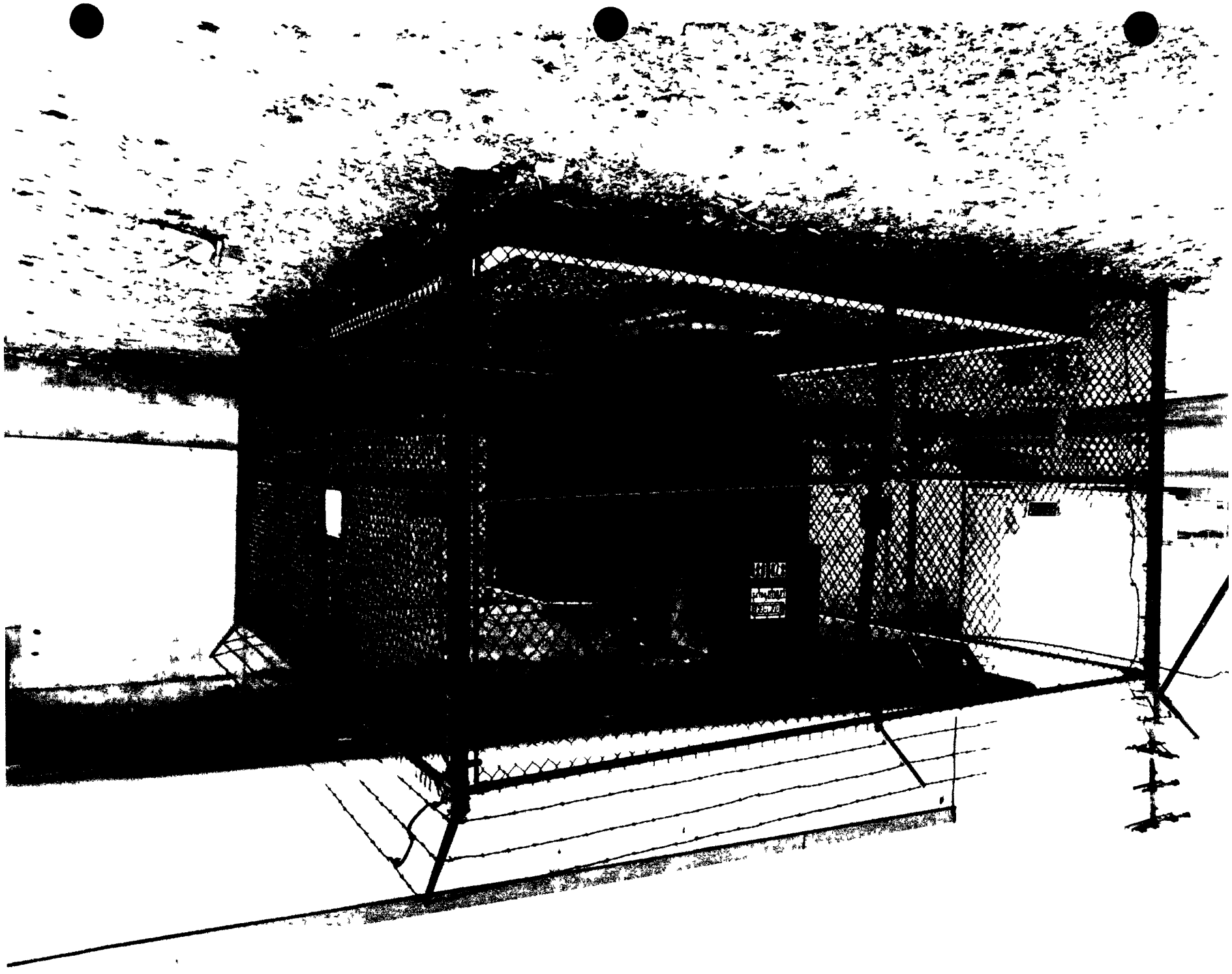
Site #16 is prioritized as a Category II



SITE #17 - Building 883 Drum Storage Area

This site consists of an old, partially removed pad (Photo #17). The transformer that was mounted on the pad is Trans 883-4 and was reported to have leaked oil containing PCBs prior to being retro-filled according to conversations with personnel from Utilities The transformer was removed, retro-filled and placed on a new pad several feet to the west. The old pad was scarified It is located in rock fill with a cracked and decomposed berm. There are no drains in the vicinity The drainage in this area is to an access road approximately six feet from the old pad. The site is located within IHSS 180 (Building 883 Drum Storage Area)

Site #17 is prioritized as a Category II



SITE #18 - Building 881 Drum Storage Area

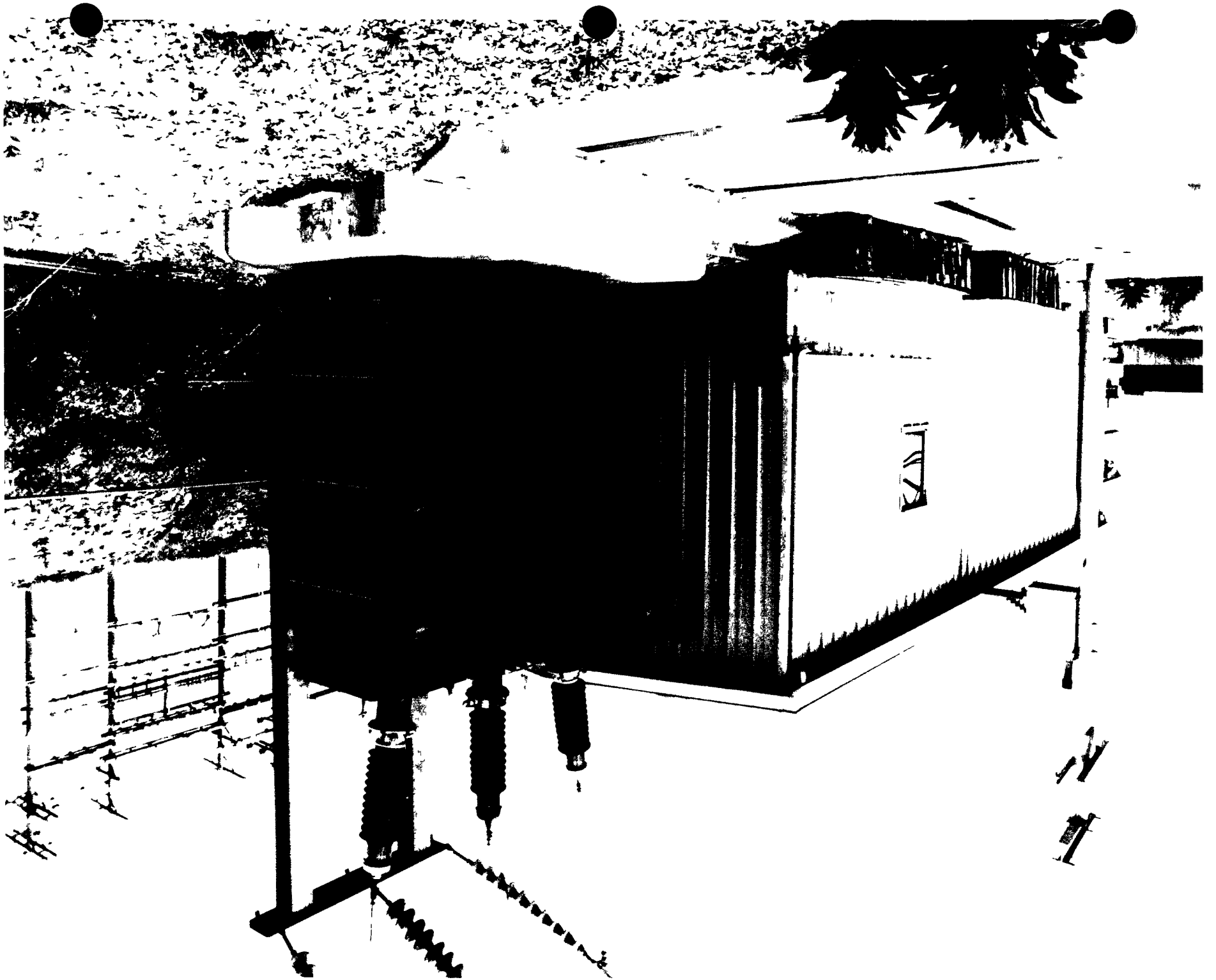
Transformer 881-4 located at this site is believed to have leaked oil containing PCBs prior to being retro-filled in 1987 according to an interview with personnel from EG&G Utilities The transformer is currently active and shows no indication of leaks. The transformer is located within the 800 area, adjacent to the north face wall of Building 881 (Photo #18) There is gravel fill inside the berm with undisturbed soil outside It is not known if there is a concrete floor under the gravel fill There are no drains in the vicinity of the site This site is located within IHSS 178 (Building 881 Drum Storage Area)

Site #18 is prioritized as a Category II.

SITE #19 - Inside Building 881

This site is located within Building 881 (Photo #19) The site will be sampled by EG&G Industrial Hygiene personnel Visible evidence during a site visit by EG&G/EMD personnel indicated a leak as observed above the valve in photo #19 There are three transformers in separate enclosed vaults with no drains and where spills would be contained due to a curbed structure at the entrance Further investigation is currently underway to assess this site

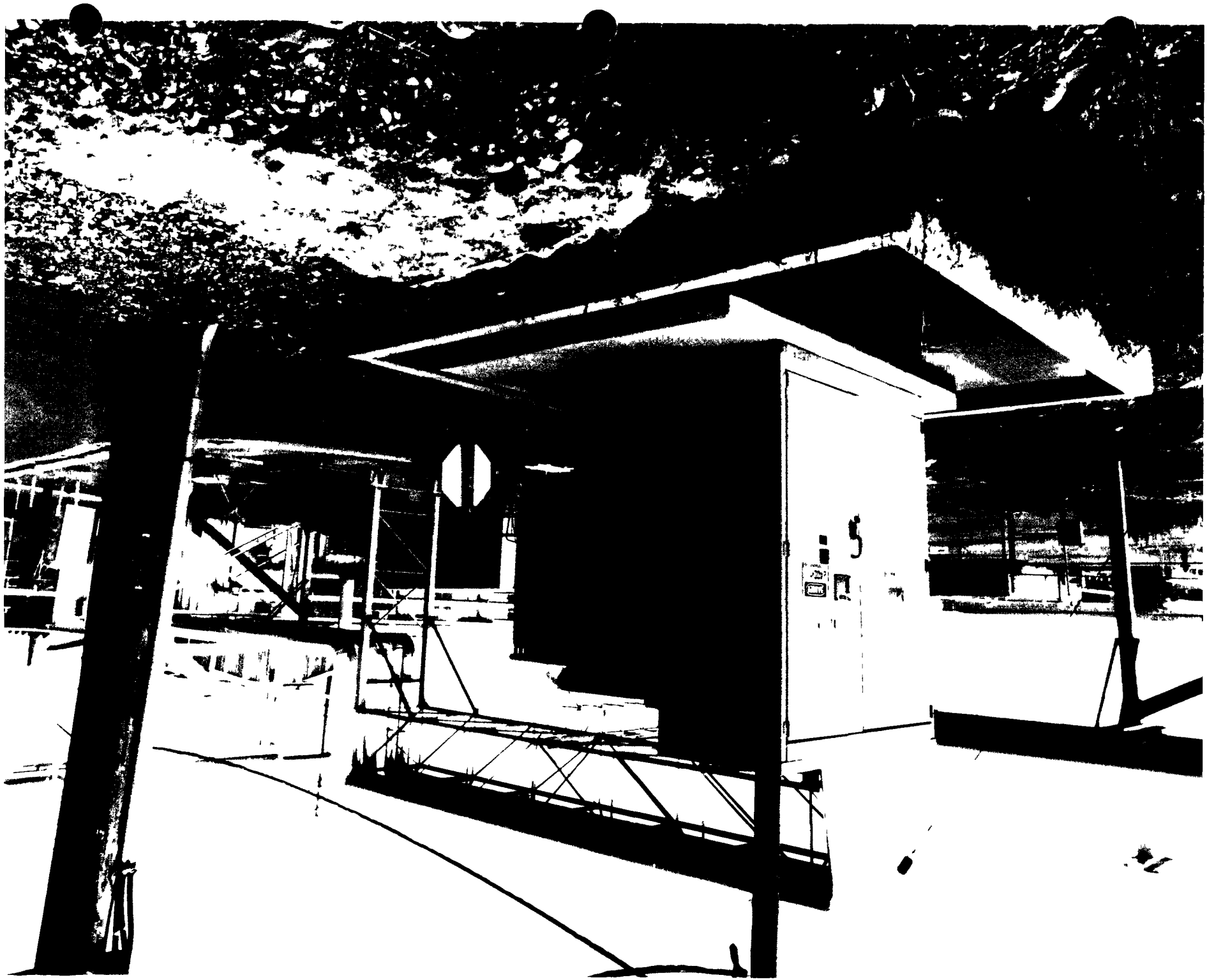
Site #19 is prioritized as a Category II



SITE #20 - South of Substation 515-516

Transformer 516 located at this site (Photo #20) shows no evidence of leaking, and it is not known whether the transformer has leaked in the past The transformer was retro-filled in 1987 Transformer 516 is situated on a concrete pad and is active There is no berm at this site Gravel fill has been placed around the pad area The transformer is located on the south side of substation 515-516 within the PA IHSS 117 1 is located approximately 400 feet to the southwest

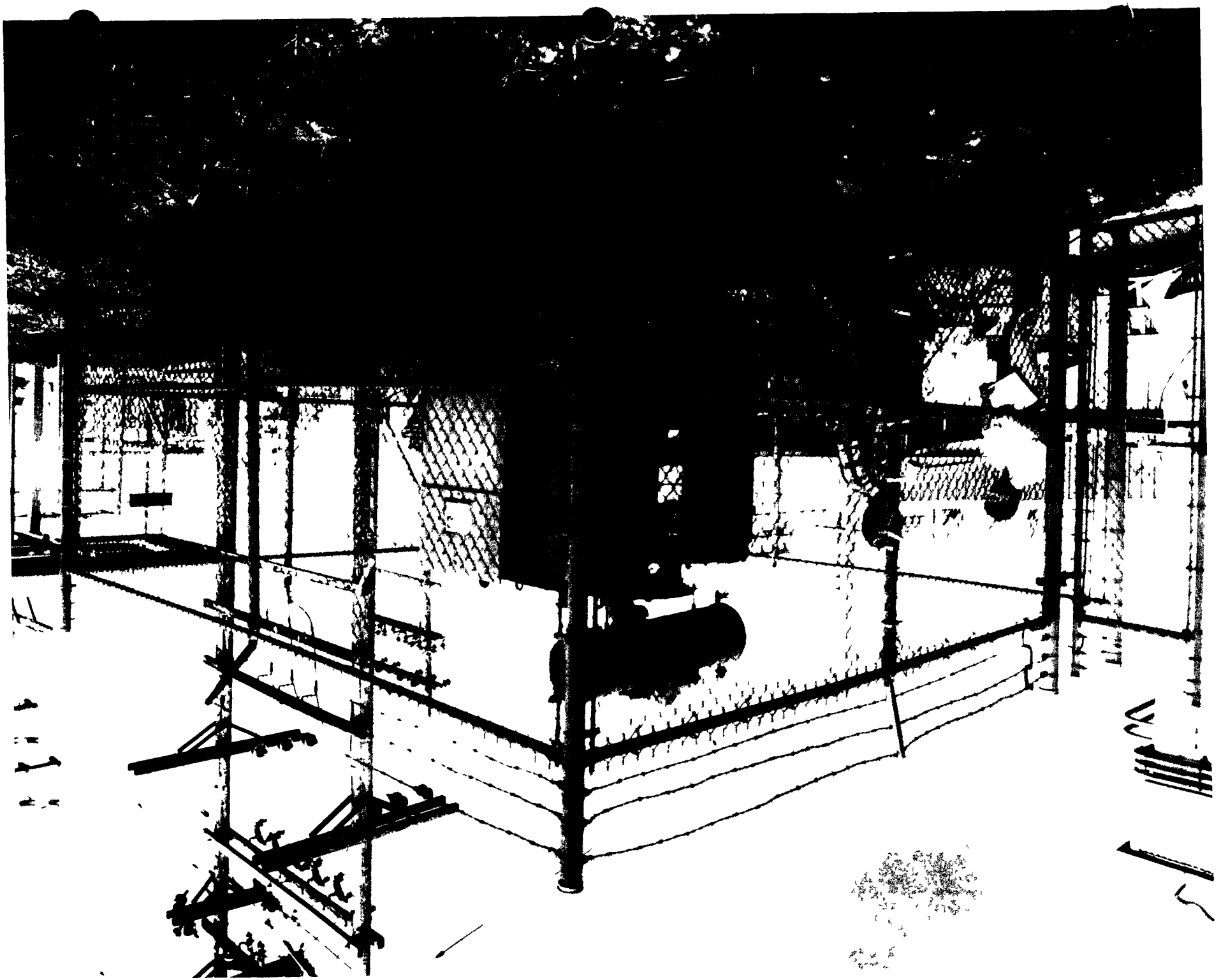
Site #20 is prioritized as a Category III



SITE #21 - Northwest corner of Building 776

This site consists of a previously utilized transformer pad which is located several feet south of the present transformer location The transformer that was located on this pad (Transformer 776-4) is suspected to have leaked (Photo #21) according to conversations with personnel from EG&G Utilities It is not known if the old pad had a berm arround it The old pad appears to have had some fill recently placed around it. The pad is located on a incline with drainage toward an access road fifteen feet to the east. No drains were located near the site. The transformer was removed for retro-filling and relocation several feet north in 1987. The pad has been partially removed to a depth of 4" The disposition of the concrete material is not known at this time, and consequently, the fate of constituents from the concrete material An effort is being pursued to locate this information The pad is located 70 feet west of the northwest corner of Building 776 and 30 feet west of IHSS 150 2

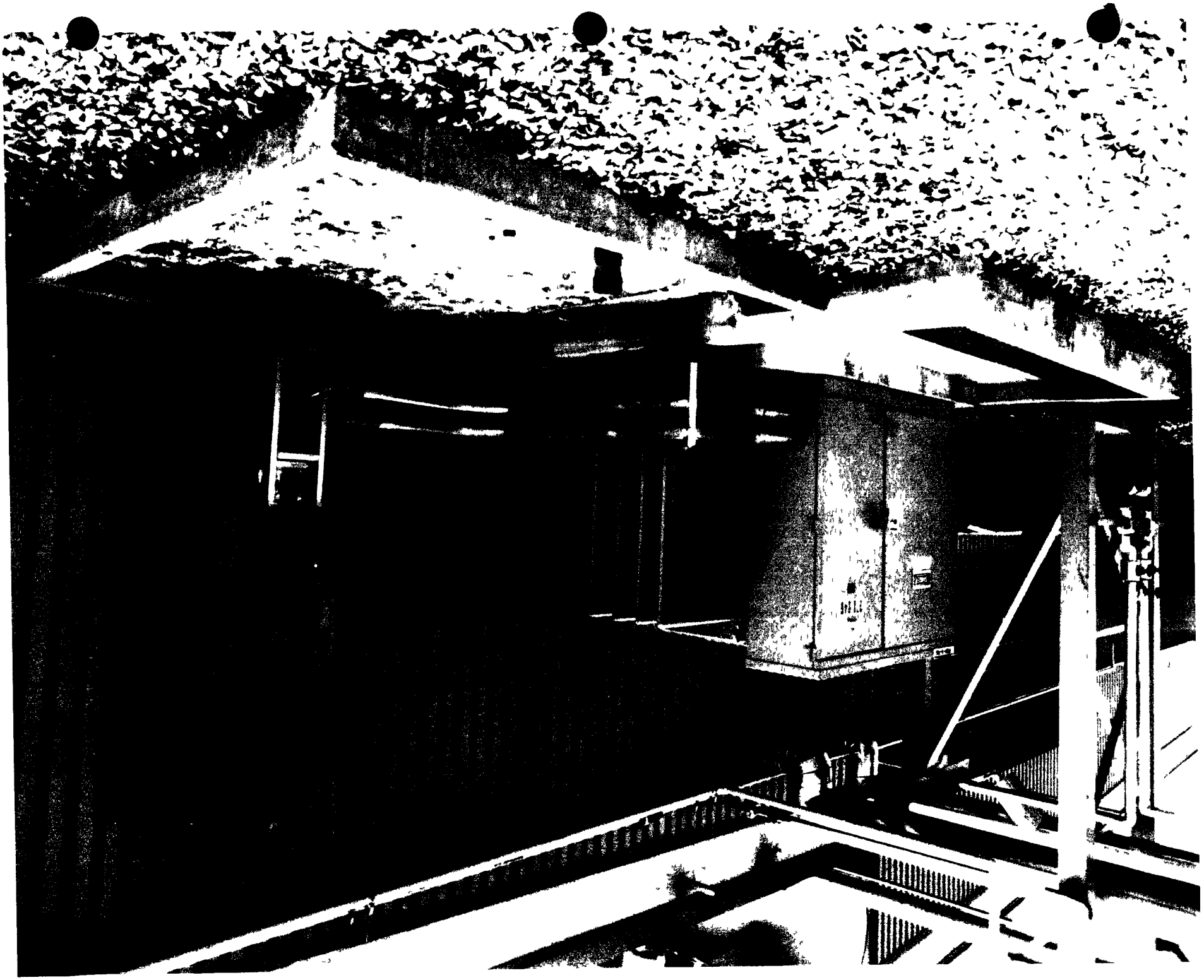
Site #21 is prioritized as a Category II.



SITE #22 - Southwest corner of Building 776

The transformer located at this site (Transformer 370-055) may have experienced a leaking valve prior to being retro-filled in 1987 according to an interview with personnel from Utilities The transformer is currently active and shows no evidence of leakage (Photo #22) The transformer is situated on a concrete pad with a berm surrounding it. The site is located on an incline There were no drains located in the vicinity The site is located 70 feet west of the southwest corner of Building 776, 30 feet west of IHSS 150 2, and 35 feet west of IHSS 162

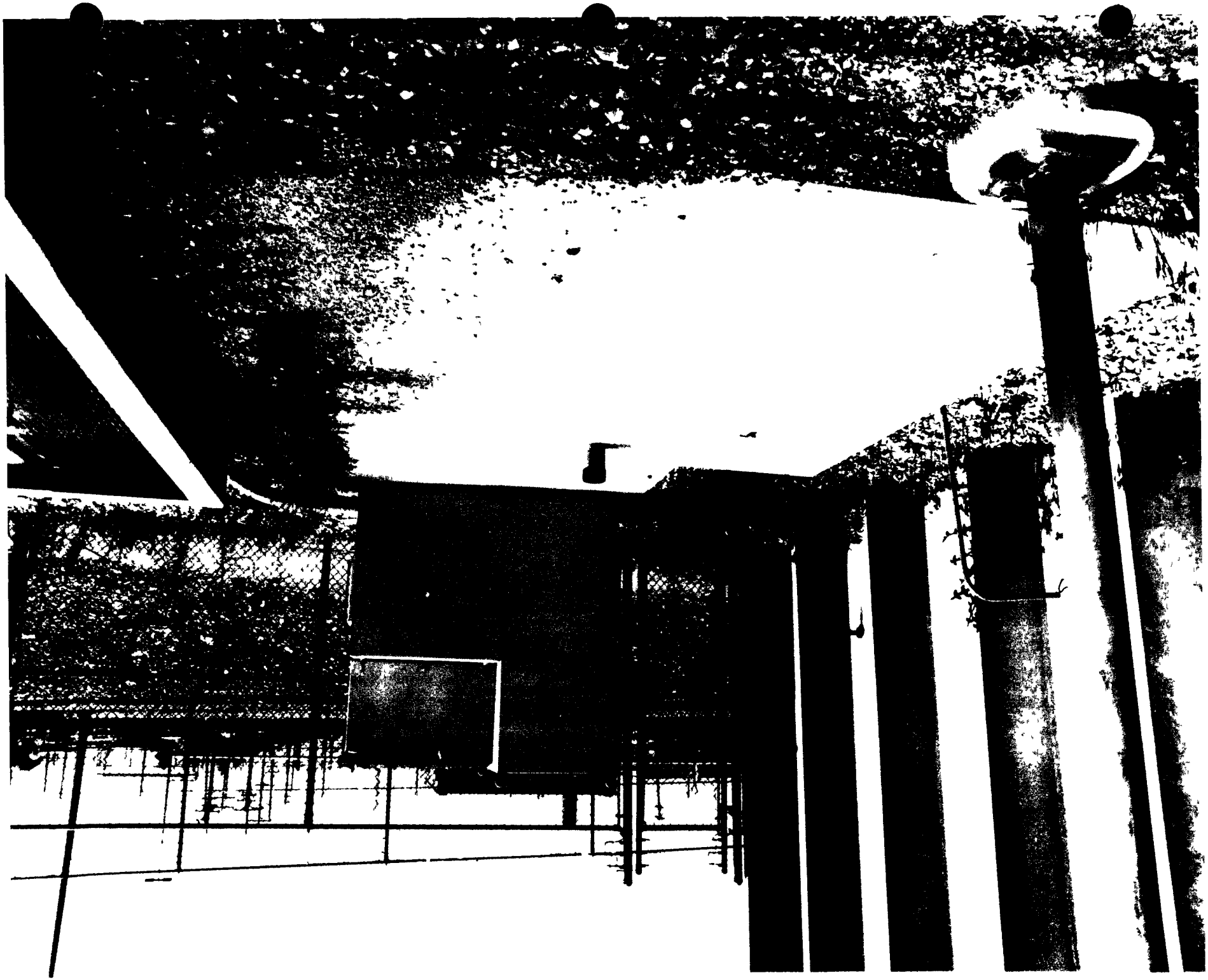
Site #22 is prioritized as a Category II



SITE #23 - Adjacent to Building 559

Transformer 559-1 located at this site (Photo 23) reportedly leaked oil containing PCBs from a faulty valve prior to being removed and retro-filled in 1987 according to an interview with Utilities personnel The transformer has since been placed on a new pad several feet south of the previous location This site is located adjacent to the east wall of building 559 as well as IHSS 159 and approximately 30 feet west of IHSSs 150 2 and 162 A cracked berm is in the location of the old pad It is not known if it was cracked at the time the transformer reportedly leaked. Concrete material was removed from the old pad. The disposition of concrete material is not known at this time, and consequently, the fate of the constituents from the concrete material. An effort is being pursued to locate this information Rock fill currently covers the area of both pads

Site #23 is prioritized as a category II



SITE #24 - West of Building 708

This site consists of four transformers that were moved and retro-filled in 1987 (Photo #24) Two of the transformers reportedly leaked oil containing PCBs from valves prior to 1987 according to an interview with personnel from EG&G Utilities The site is located approximately 70 feet south of IHSS 150 5, 150 feet north of IHSS 147.1 and 90 feet east of IHSS 121 This area is within the PA and several feet west of building 708 The transformer pad in photo #24 is the only pad at this site without a berm Rock and gravel fill was placed around the pad

Site #24 is prioritized as a Category II

SITE #25 - East of Building 707

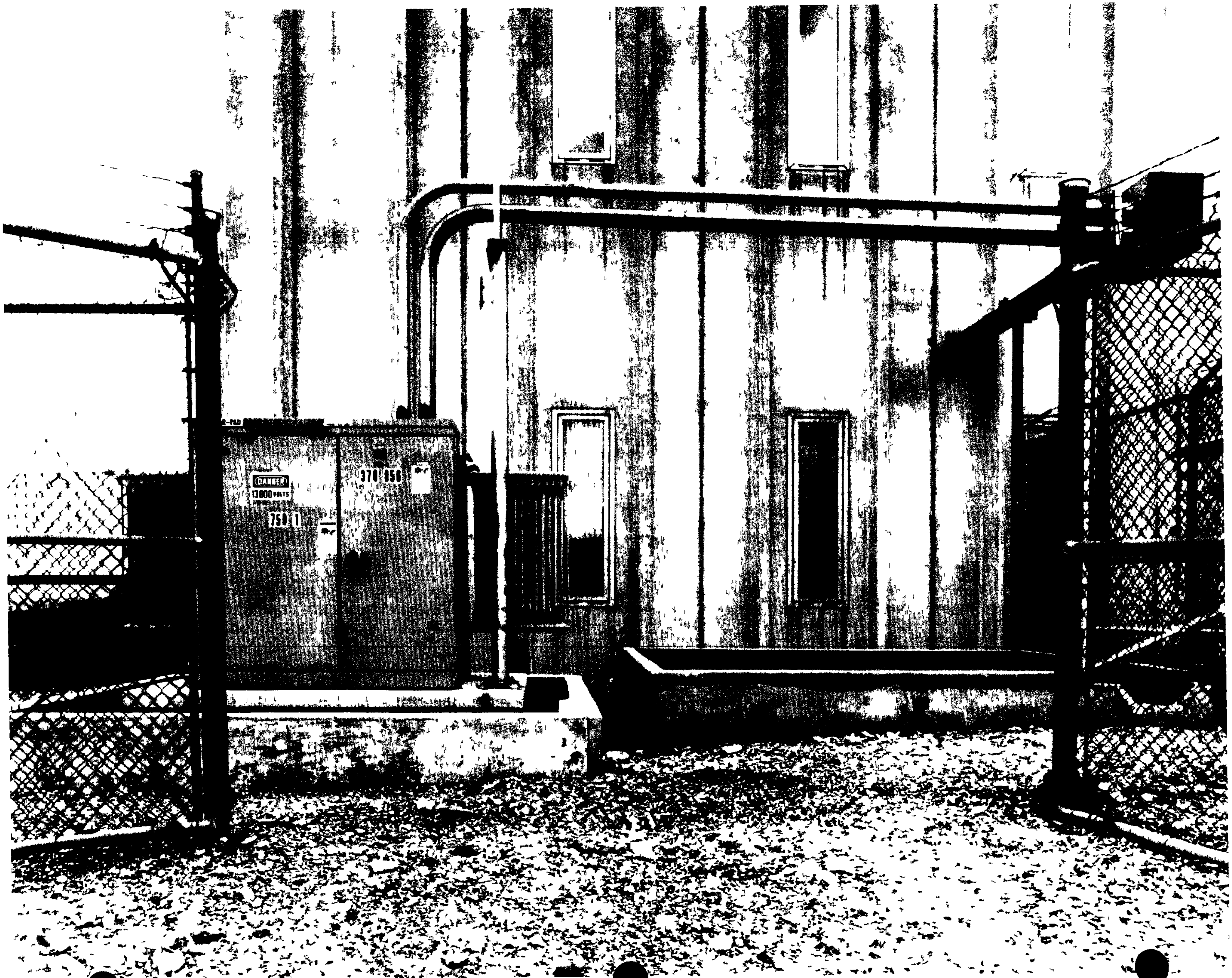
This site is located along the east side of Building 707 in a courtyard area (See Insert) Transformer 707-1 is documented as having leaked oil containing PCBs since 1987 The leak was discovered during routine maintenance when the transformer was found to be low in fluid and visible evidence of leaks were discovered at the valve area and weld seams Based on recent analysis of soil and surficial swipe samples it was confirmed that the pad setting on the roof and the soil on the ground adjacent to Building 707 are contaminated with PCBs (Table 1 and Map Insert) and had originated from the transformer on the roof of Building 707 The soil contamination is due to a downspout dispersing rainwater onto the ground from the area of the transformer There are three IHSSs in the vicinity of the area to be sampled, 185, 192, and 194 These sites are included in the OU16 Low-Priority Sites. This site is currently being addressed by EG&G with the building structure to be cleaned up under TSCA, and the soils will be addressed in the IAG as a new or existing IHSS and/or OU

Site #25 is prioritized as a Category I

Table 1

Date Sampled	Map ID #	Surface*	1-1/2 Foot Depth*	Units
March 14, 1991	1	1600	15	mg/kg
March 14, 1991	2	170	2 6	mg/kg
March 14, 1991	3	53	2 8	mg/kg
March 14, 1991	4	33	14	mg/kg
March 14, 1991	5	650	180	mg/kg
March 14, 1991	6	180	14	mg/kg
March 14, 1991	7	69	11	mg/kg
March 14, 1991	8	20	8 7	mg/kg
March 14, 1991	9	9 7	6 0	mg/kg
March 14, 1991	10	25	2 8	mg/kg
March 14, 1991	11	9 8	<1	mg/kg
March 14, 1991	12	370	2 5	mg/kg
March 14, 1991	13	37	16	mg/kg

* Sample concentrations within the 1254 and 1260 Aroclors


DANGER
13800 VOLTS
750 1
370 056

SITE #26 - North of Building 750

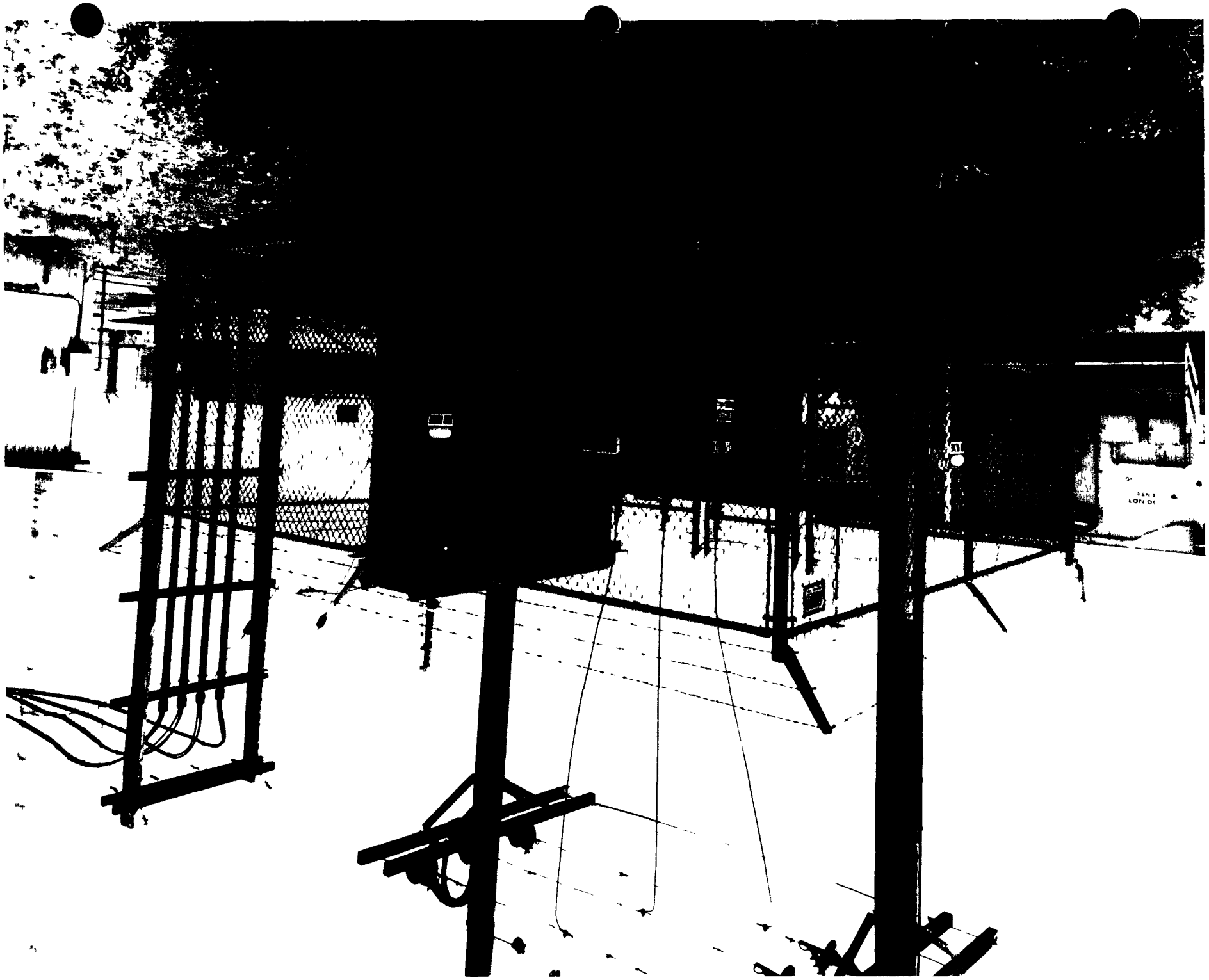
Documentation in plant files indicates that the transformer (750-1) at this location (Photo #26) leaked oil containing PCBs prior to being relocated and retro-filled in 1987 according to interviews with Utilities personnel The old transformer is now located on a new pad several feet east of its previous location There are berms around the site with no fill There are no drains in the vicinity of the site This area is 5 feet north of building 750 and is located in IHSS 150 4, 100 feet west of IHSS 214 and 70 feet south of IHSS 150 6.

Site #26 is prioritized as a Category II

SITE #27 - Inside Building 771

This site is located inside Building 771 Based on a interview with Utilities personnel, a leak occurred at this location The transformer was removed, samples were collected, the area decontaminated and the pad encapsulated There are five floor drains in this area that were capped in 1968 The leak occurred in 1987 There is no berm at this site There is no photograph available

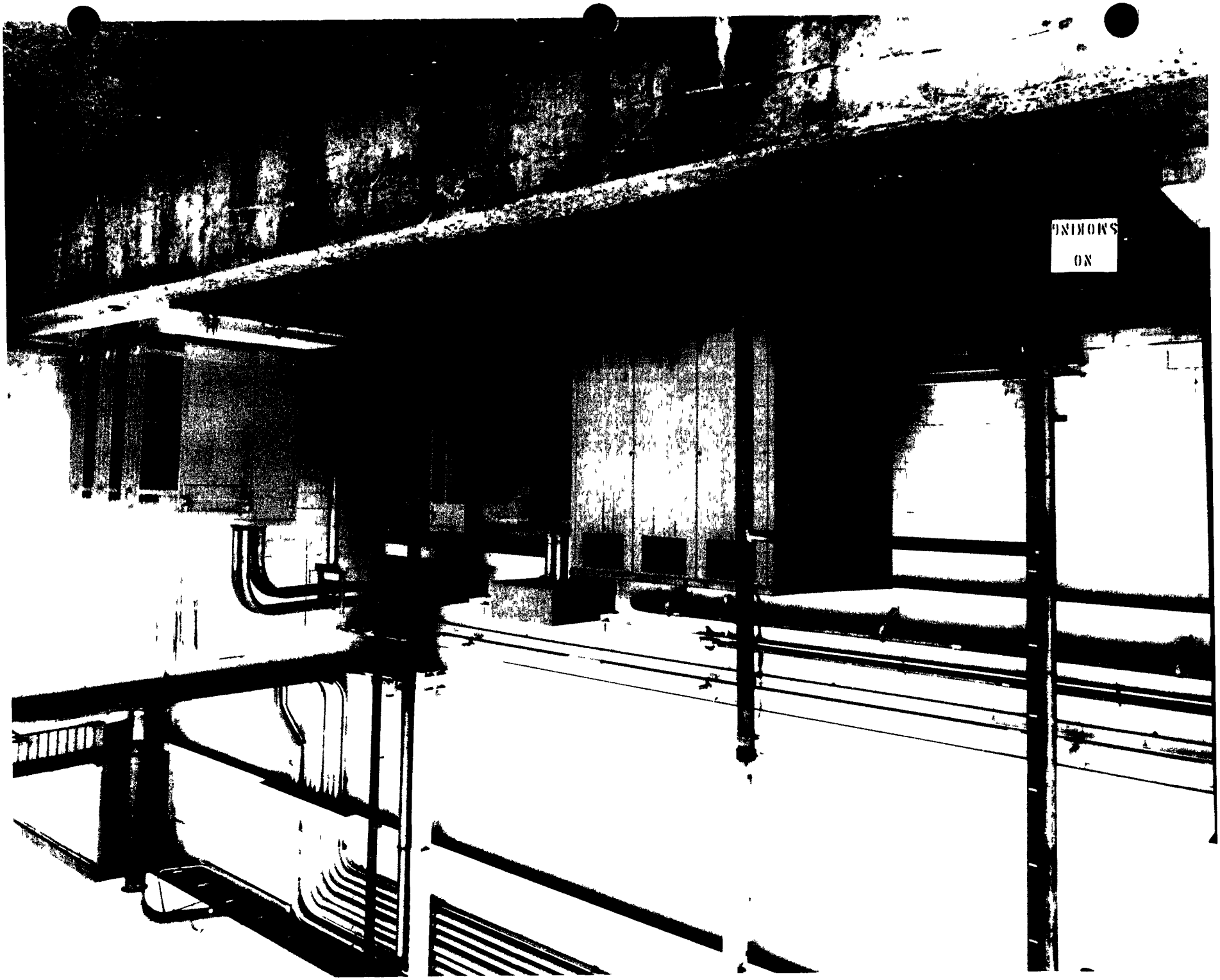
Site #27 is prioritized as a Category I



SITE #28 - South of Building 771

Transformer 714-1 is situated on a concrete pad 70 feet south of building 771 (Photo #28) There is gravel fill inside the berm and no drains in the vicinity There is no historical evidence of leakage from this transformer Surficial soil samples were obtained adjacent to the four corners of the pad outside the berm during a May 1991 PCB screening effort to determine the source of contamination at Sediment Sampling Location 124, (Site 31) Analysis from surficial soil samples does not show evidence of contamination Additional soil samples may need to be taken during future investigations to determine if the site is clean

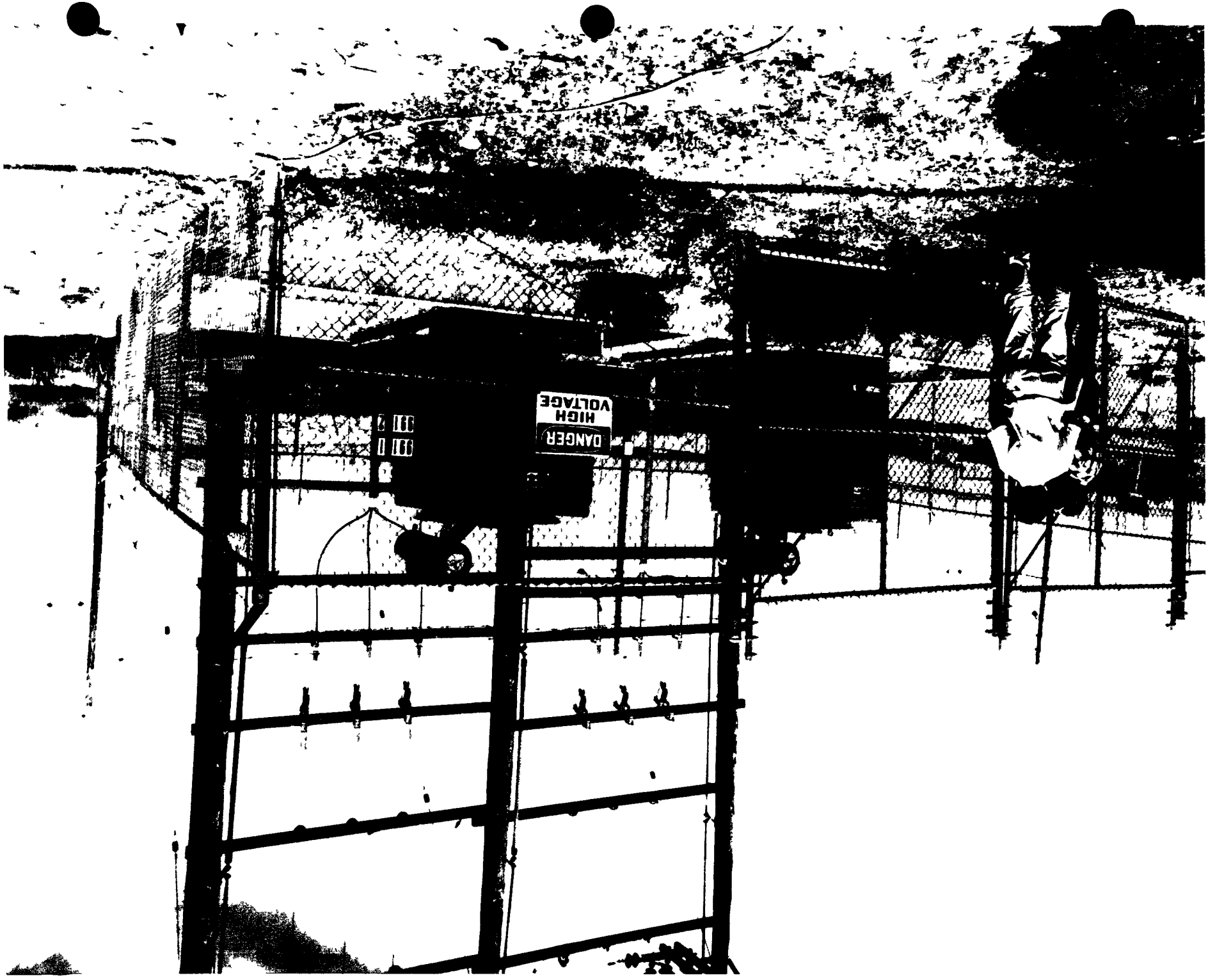
Site #28 is prioritized as a Category III


ONDOWS
ON

SITE #29 - North of Building 779

Transformers 779-1, and 779-2 are located at this site just north of building 779 (Photo #29) The two transformers have leaked oil containing PCBs prior to being retro-filled and relocated several feet east and north respectively in 1987 according to a conversation with personnel from Utilities The site is located approximately 40 feet south of IHSSs 138 and 150 8, and 300 feet southeast of IHSS 121 There are concrete berms surrounding the site with rock and gravel fill surrounding the individual pads

Site #29 is prioritized as a Category II


DANGER
HIGH
VOLTAGE

SITE #30 - East of Building 991

EG&G Utilities has documentation indicating that numerous leaks of oil containing PCBs occurred from two transformers located at this site prior to 1987 (Photo #30) The transformers (991-1, 991-2) were retro-filled in 1987 They appear to be leaking at present, as evidenced by the stains on the pads directly beneath the valves attached to the northwest face of the transformers The site is 26 feet to the east of building 991, adjacent to (IHSS 173) and 80 feet west of IHSS 192 The area is bermed with gravel and stone used as fill

Site #30 is prioritized as a Category II

Site #31 - Northwest of Solar Ponds

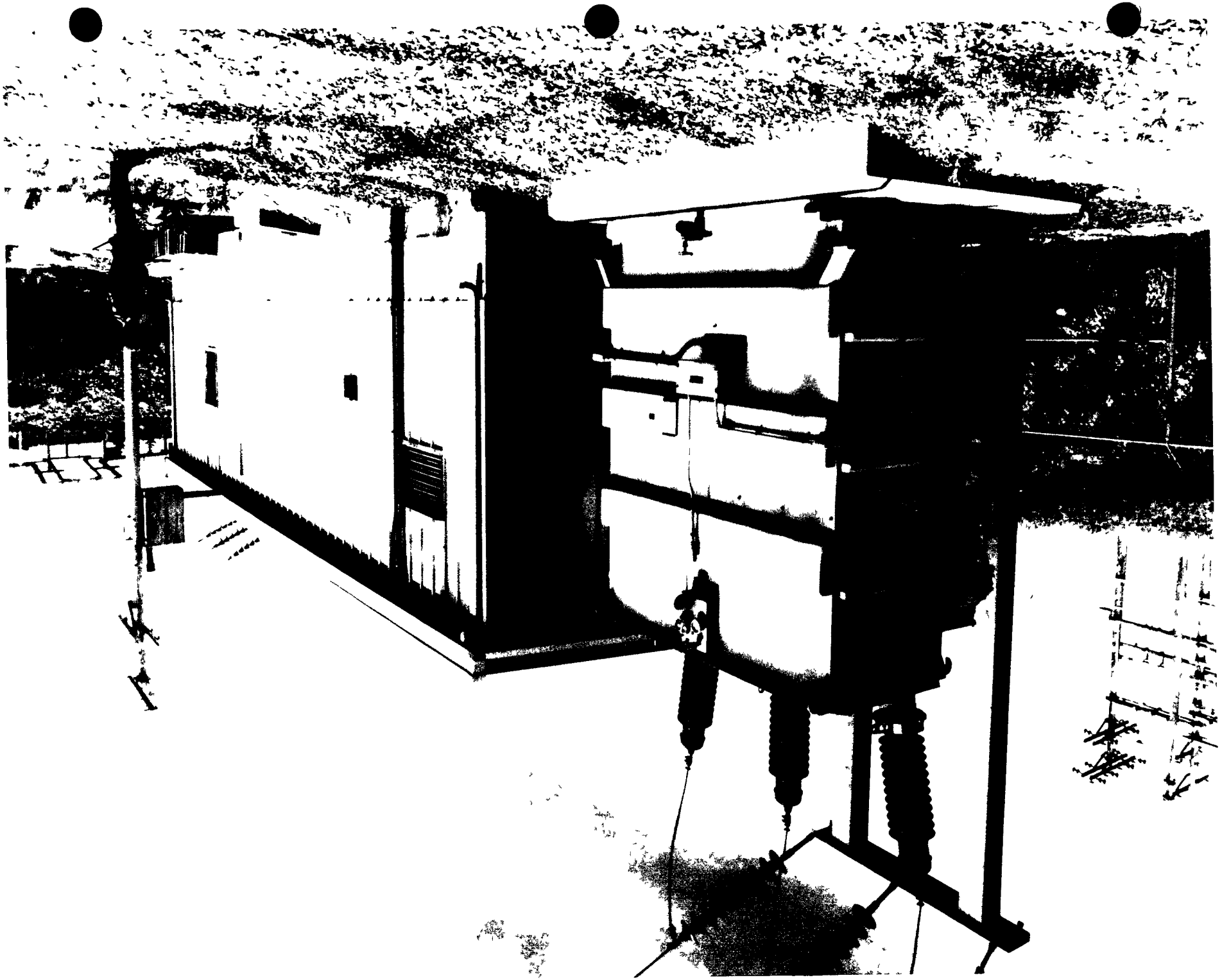
EG&G detected elevated concentrations of PCBs (Aroclor 1254) in sediment samples collected during routine soil sampling in October, 1990 in a ditch located approximately 400 feet northwest of the Solar Evaporation Ponds (station SED 124) Aroclor was detected at concentrations of 66,000 ppb (Map Insert and Table 2) Station SED 124, designated as sampling point #17 on the site map , was established and sampled for the first time during this sampling period, thus no prior historical data exists Upon receipt of the first analysis, EG&G re-extracted and re-analyzed the samples to check for laboratory error, the analytical results from the second analysis supported the initial findings for SED 124 (re-run analysis = 67,000 ppb) It is not known where the release originated

The extent of PCB contamination found in sediments downstream of SED 124 has been confirmed to be low (attached map) based on nine random soil samples collected in May 1991. Another nine samples were collected in the immediate area surrounding SED 124 and indicate that contamination is present at lower levels near the site Additional samples were taken upstream of SED 124 (see map) around an existing transformer with low contamination Analytical data from sampling activities to date is presented in Table 2 on the following page. Further sampling will be necessary to define the extent of this contamination All radiological screening performed on samples prior to shipment to offsite labs has revealed activity less than 50 pCi/gram
IHSS units 150 1, 139 1, 139 2, 163 1, and 163 2 are near station SED 124 and included in Operable Unit 8 There is no photograph available for this site

Site #31 is prioritized as a Category I

Table 2

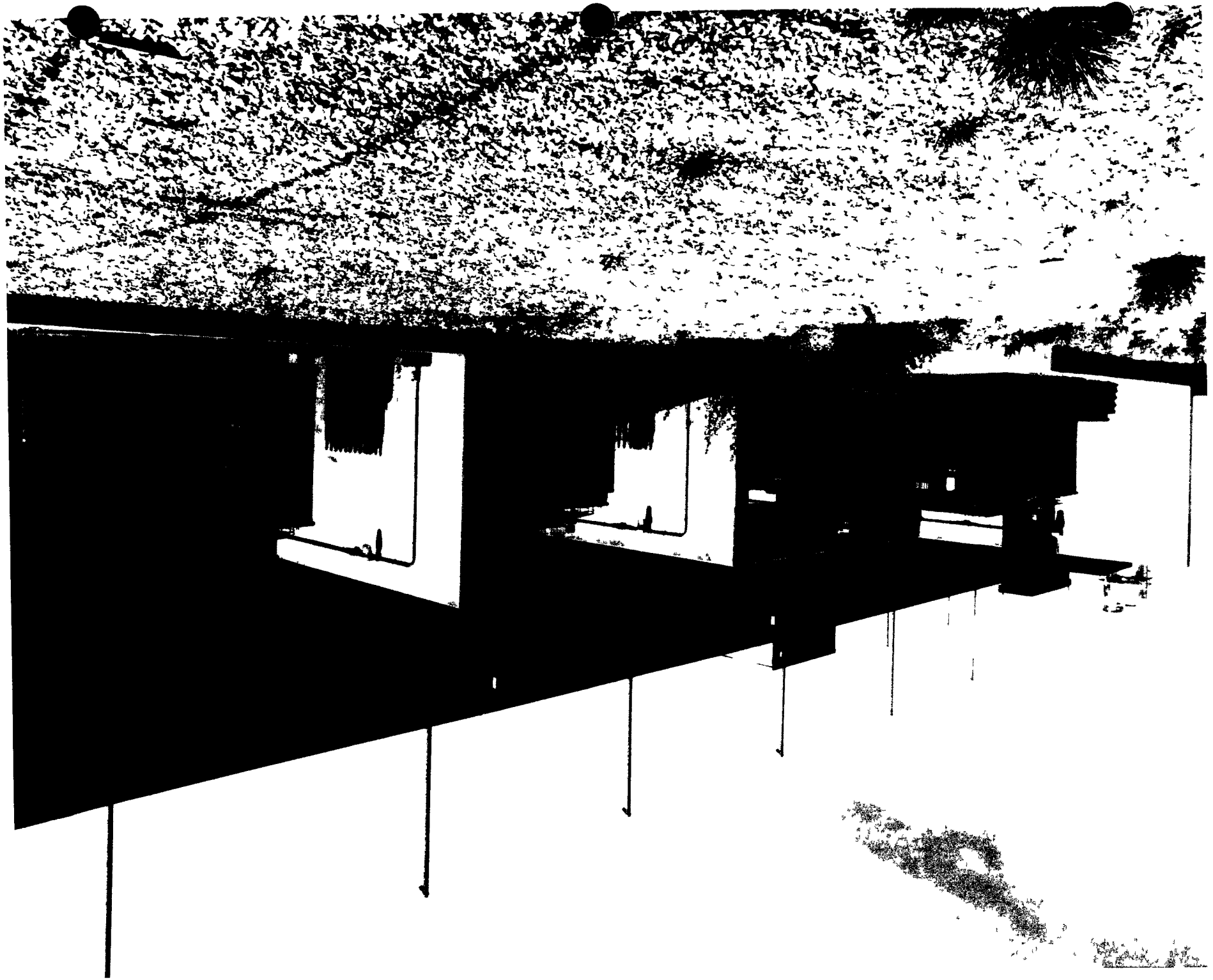
Date Sampled	Sample #	Map ID #	Ar 1254	Units
Oct 12, 1990	SS00163WC	# 17	66,000	ug/kg
April 19, 1991	SS00197WC	# 17	67,000	ug/kg
May 9, 1991	SS00312ST	# 1	Non Detec	ug/kg
May 9, 1991	SS00313ST	# 2	< 21	ug/kg
May 9, 1991	SS00314ST	# 3	< 21	ug/kg
May 9, 1991	SS00315ST	# 4	63	ug/kg
May 9, 1991	SS00316ST	# 5	38	ug/kg
May 9, 1991	SS00317ST	# 6	25	ug/kg
May 9, 1991	SS00318ST	# 7	33	ug/kg
May 9, 1991	SS00319ST	# 8	< 21	ug/kg
May 9, 1991	SS00321ST	# 9	230	ug/kg
May 9, 1991	SS00322ST	# 10	1,500	ug/kg
May 9, 1991	SS00324ST	# 11	3,700	ug/kg
May 9, 1991	SS00325ST	# 13	8,700	ug/kg
May 9, 1991	SS00327ST	# 14	4,300	ug/kg
May 9, 1991	SS00328ST	# 15	220	ug/kg
May 9, 1991	SS00329ST	# 16	2,300	ug/kg
May 9, 1991	SS00331ST	# 17	1,800	ug/kg
May 9, 1991	SS00332ST	# 18	820	ug/kg
May 9, 1991	SS00333ST	# 19	21	ug/kg
May 9, 1991	SS00334ST	# 20	88	ug/kg
May 9, 1991	SS00335ST	# 21	63	ug/kg
May 9, 1991	SS00336ST	# 22	62	ug/kg
May 9, 1991	SS00324ST	# 11	3,700	ug/kg
May 9, 1991	SS00325ST	# 12	1,600	ug/kg



SITE #32 - North of Substation 515-516

Transformer 515 is located within the PA where it is situated on a concrete pad just north of substation 515-516 (Photo #32) It is currently active and there is no evidence of past or present leaking oil The 515 transformer is currently being researched, and little information is available concerning whether it was retro-filled IHSS 117 1 is approximately 400 feet to the southwest There is no berm located at this site There is some rock fill in the area of the transformer

Site #32 is prioritized as a Category III.



SITE #33 - North of Building 371

There are six transformers located at this site north of building 371 within the PA (Photo #33), all are surrounded by berms There is rock fill in the vicinity of the transformers Transformers 371-1, 371-2, 371-3, 371-4, 371-5, and 371-6 may have leaked oil containing PCBs from valves prior to being retro-filled in 1987 according to conversations with personnel from Utilities None of the transformers have been relocated. Transformer 371-1 is presently leaking from a valve attached to the east side of the unit as evidenced by staining on the pad directly beneath the valve The site is 200 feet southwest of IHSS 151 and 300 feet west of IHSS 206

Site #33 is prioritized as a Category II.

SITE #34 - Inside Building 371

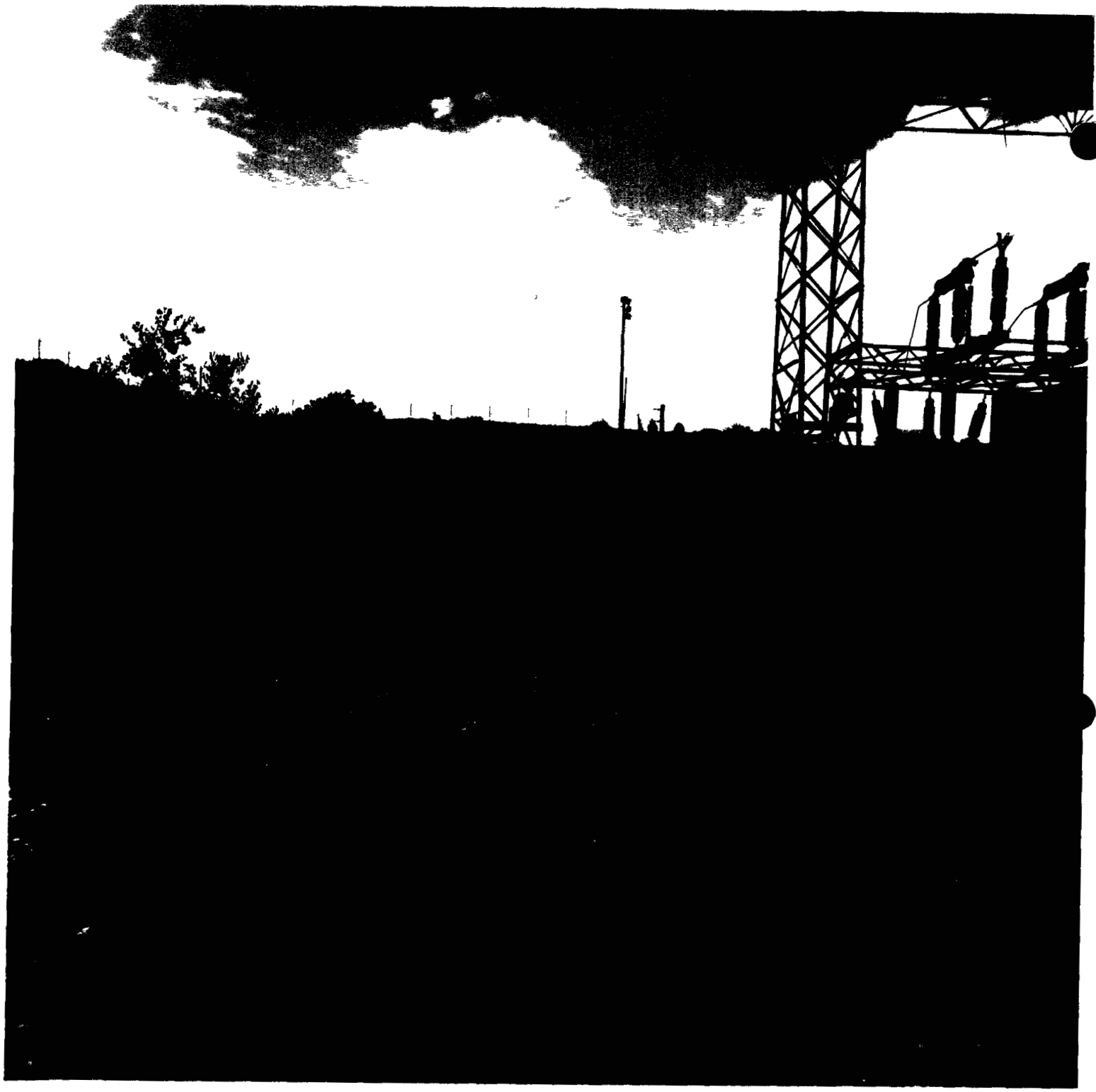
This site is located inside Building 371 There is no berm located at this site or drains or sewer lines in the vicinity There is no available photograph of this site

Site #34 is prioritized as a Category III

Site #35 - East of Building 374

Seventeen fifty-five gallon drums of PCB contaminated oil were stored at this site (Photo #35) for the U S Environmental Protection Agency (EPA) Arrangements were made to store the drums in the 517-518 transformer yard near Sixth Steet and just east of Building 374 The drums containing PCBs were discovered on the Darling Farm, in Lafayette, CO in 1979 and subsequently transferred to Rocky Flats Plant for temporary storage in 1980 The drums were removed from RFP in July of 1982

Site #35 is prioritized as a Category III



4 0 POTENTIAL FATE AND TRANSPORT OF PCBs

The data reported in soils by Aptus (April, 1991) from the release of PCBs at building 707, as well as a review of the potential for PCB migration in the environment indicates a very low probability of PCBs migrating from the area in which they have been reported For the purpose of evaluating the potential fate and transport of PCBs, the 707 Building release will be used as a template The Following is an evaluation of PCB migration tendencies based on physical/chemical fate and transport parameters in conjunction with a review of relevant supporting environmental sampling and analysis data

PCBs are regarded as relatively immobile in the environment This is illustrated by a review of the following chemical/physical indicators of environmental mobility (Aroclor 1254)

Mobility Indicator	Aroclor 1254	Arclor 1260
Mobility Index *	-11 (Very Immobile)	-14 (Very Immobile)
Water Solubility	31 ug/l	2 7 ug/l
Soil Absorption Coefficient	5 3 E+6 ml/gr	6 6 E+6 ml/gr
Vapor Pressure	7 7 E-5 mm Hg (25oc)	4 05 E-5 mm Hg (25oc)
Soil/Water Distribution Kd	5,300 ml/gr	67,000 ml/gr
Saturated Zone Rd	47200	595,600

Source of Chemical/Physical Data Mabey, et al , 1982

As indicated, PCB's are relatively immobile in the environment Water solubility indicates the tendency for a compound to migrate as a solute PCB 1254's low water solubility (2 7 parts-per-billion) confirms a low tendency for migration in ground water and surface water as a solute The soil absorption coefficient quantifies the tendency of a compound for adsorption to solids containing carbon (such as soils and sediments) A very high soil absorption coefficient of 6 6 E+6 characterizes PCBs strong adsorption tendency As indicated, PCBs are marked by very low vapor pressures and little tendency to vaporize to the atmosphere The high soil organic carbon/water distribution coefficient (Kd) indicates an expected soil to water equilibrium distribution of approximately 5,300 to 1 Each Kd is computed as the product of the soil adsorption coefficient and the assumed soil fractional organic carbon content (foc), Kd= (Koc * foc) Thus, the organic carbon content of the soil is a significant contributor to PCB migration potential Kd is also used in the computation of saturated zone retardation factors (Rd) PCBs are relatively immobile as a dissolved constituent in saturated porous media (i e , groundwater) as indicated by their high retardation factor (Rd= seepage velocity/chemical velocity)

*The mobility index (MI), developed by Ford and Gurba (1984) produces a number that is proportional to the contaminants probability of escaping its point of origin and migrating through the air or water MI is calculated as follows

MI= $\log_{10}$[(water solubility * vapor pressure)/soil adsorption coefficient]
The authors provide a relative mobility index descriptor ranging from MI > 5 0 (extremely mobile) to MI < -10 0 (very immobile)

Because of their strong tendency for sorption to solids (i e soil) PCB transport to surface water is likely to be controlled by soil migration resulting from overland flow Natural or manmade features that affect overland flow might include berms, drains or sewers Occurrence of a berm would tend to reduce the potential for transport of PCB-contaminated soil from the site Drains and sewers would intercept flow and direct it to a predetermined location such as outfall, thus having the effect of enhancing the transport of PCB contaminated soils from the site An additional factor impacting the fate and transport of soils containing sorbed PCBs is the nature of the soil that constitute the source Soils that are unconsolidated and easily dislodges by fluid action across the surface would tend to be released easier than soils that are consolidated or otherwise congealed This suggests that excavated soils (or similar debris) stored in a pile could have the tendency to function as a viable source for release of PCBs to the environment In contrast, soils that support vegetative growth are not as viable a source for a release to the environment owing to their affinity for retaining soil particles

A potential, though unlikely PCB source could be PCB contaminated oil existing as DNAPLs and LNAPLs in porous media where they could move under the influence of gravity and capillary forces However, considering the low volume of a contaminated oil release and the unlikely occurrence of PCB contaminated oil existing as NAPLs, this scenario is not believed to present a significant source of contamination

Based on this review, PCBs released from the transformer could migrate to off-site environs only through transport as adsorbed suspended matter through (1) surface water flow or as (2) windborne particulate Neither of these potential transport pathways are considered significant as conveyances for migration of PCBs to an off-site receptor However, PCBs in the environment on-site may pose a potential risk to the ecosystem

The following analysis of the 707 Building PCB release will be used to assess the potential for PCBs to be transported as adsorbed suspended sediment matter through the surface water pathway from there (1) point of origin to (2) an on or off-site receptor Based on the configuration of the physical system, there appears to be a potential for suspended matter containing adsorbed PCBs to be transported from their point of origin However, the system configuration also suggests that there is little chance for surface water transport of suspended matter containing adsorbed PCBs from the 707 Building spill area to an offsite receptor This is because the surface water pathway is through the B-Series Ponds and the Walnut Creek drainage It is conceivable that PCBs could by transported by this surface water conveyance on suspended particulate, however, the results of sampling and analysis in this systems suggests that such migration has not occurred A summary of PCB analyses conducted in this system is presented below

Location	Samples/PCB-Obs.	Remark
Sed 11	3 / 1	Single report of Aroclor 1254 at 0 54 mg/kg
Sed 12	1 / 0	PCB's not detected
Sed 32	N/S	Not sampled
Sed 33	N/S	Not sampled
Sed 13	1 / 0	PCB's not detected
Sed 03	1 / 0	PCB's not detected

Sediment sample 11 and 12 are upgradient from the B-Series ponds of the Walnut creek drainage, Sed 11 being furthermost upgradient sample site Sediment 32 is located between ponds B-4 and B-5 The remaining sediment sites are located downstream from B-5 This data demonstrates that the system reach is unaffected by any upgradient PCB release such as the 707 Building transformer incident Observation that support this determination are·

PCB contamination in the system is limited to a single report of Aroclor 1254 detected at the headwater of the system reach

The single occurrence of Aroclor 1254 is reported to be at a concentration that does not represent a significant potential for intermedia transfer (0 54 mg/kg corresponds to a maximum equilibrium aqueous concentration of 10 ug/l) PCBs have not been detected in potentially related surface or groundwater

The single occurrence of Aroclor 1254 at the system headwaters has not migrated downstream

The potential for windborne transport of suspended matter containing adsorbed PCBs from the spill area to an offsite receptor is also small In view of the considerable travel distance to an off-site human receptor and the effects of dispersion, settling-out, as well as resuspension and varying wind patterns, concentrations and the duration to which a humans could be exposed would be insufficient to produce adverse impacts An analysis of the potential for a worker to be impacted by PCBs resuspended on soil particles demonstrates that only under highly unlikely conditions would worker expsoure concentrations approach regulatory limits

In summary, the theoretical development of potential PCB transport in the environment presented is validated by review of field sampling and analysis data

5 0 PROPOSED ACTIONS AND SCHEDULE

EG&G is currently reviewing records/documents applicable to potential PCB spills/releases at RFP In the event a PCB site is identified, a limited number of samples will be collected to verify the presence or absence of PCB contamination If sites are determined to be contaminated with PCBs, the EPA and CDH will be notified of the historical release in accordance with the IAG As stated in the IAG, "Whenever a newly identified or suspected release of hazardous substance occurs or is discovered, it may be added to one of the sixteen existing OUs or it may become another OU, as agreed to by the Parties of the Agreement "

Pursuant to the IAG, Attachment 2, Section 1 B 3 (Notification) DOE is required to notify EPA and the State of any newly identified or suspected releases, or threats of release, from any or all of the sites If a site is determined to be contaminated with PCBs, EG&G will notify DOE/RFO of the historical release/spill with a draft notification letter to be transmitted to EPA and CDH. All PCB sites will be incorporated into the Historical Release Report (HRR), an IAG deliverable, for further assessment Sites that are determined to be contaminated with PCBs will be proposed to be incorporated into the IAG and managed within an existing OU or an independent OU The appropriate IAG requirements will be applied to the PCB sites, i e , preparation of an RFI/RI workplan, development of an IM/IRA plan, corrective measure study, etc

The following is the plan of activities and their scheduled completion dates for the initial stage of PCB site assessments

SCHEDULE OF ACTIVITIES

ACTIVITY	STATUS
Identify Potential PCB Sites	Completed
PCB Site Inspection	Completed
Site Prioritization	Completed
Sample Collection	Completed
Sample Analysis	Scheduled Complete 9/30/91
Final Report	Scheduled Complete to DOE 1/30/92

During the preliminary assessment of defining PCB sites, additional PCB sites may be identified In the event additional PCB sites are identified, the same criteria will be applied as referenced above in relation to notifying DOE/RFO, EPA and CDH and incorporating sites into the IAG

6 0 REFERENCES

APTUS, 1991, (Draft) PHASE 1 INVESTIGATION AND CORRECTIVE ACTION PLAN FOR EG&G ROCKY FLATS GOLDEN, COLORADO 1991

BIBLIOGRAPHY

Mabey, W R , Smith, J H , Podoll, R T , Johnson, H L , Mill, T , Chou, T W , Gates, J , Partridge, I , Jaber, H , and D Vandenberg 1982, Aquatic Fate Process Data for Organic Priority Pollutants, EPA 440/4-81-014, Office of Water Regulations and Standards, USEPA, Washington DC

Ford, K L , and P Ford 1984, Methods of Determining Relative Contaminant Mobilities and Migration Pathways Using Physical-Chemical Data, In, Management of Uncontrolled Hazardous Waste Sites, Hazardous Material Research Institute, Silver Spring, MD

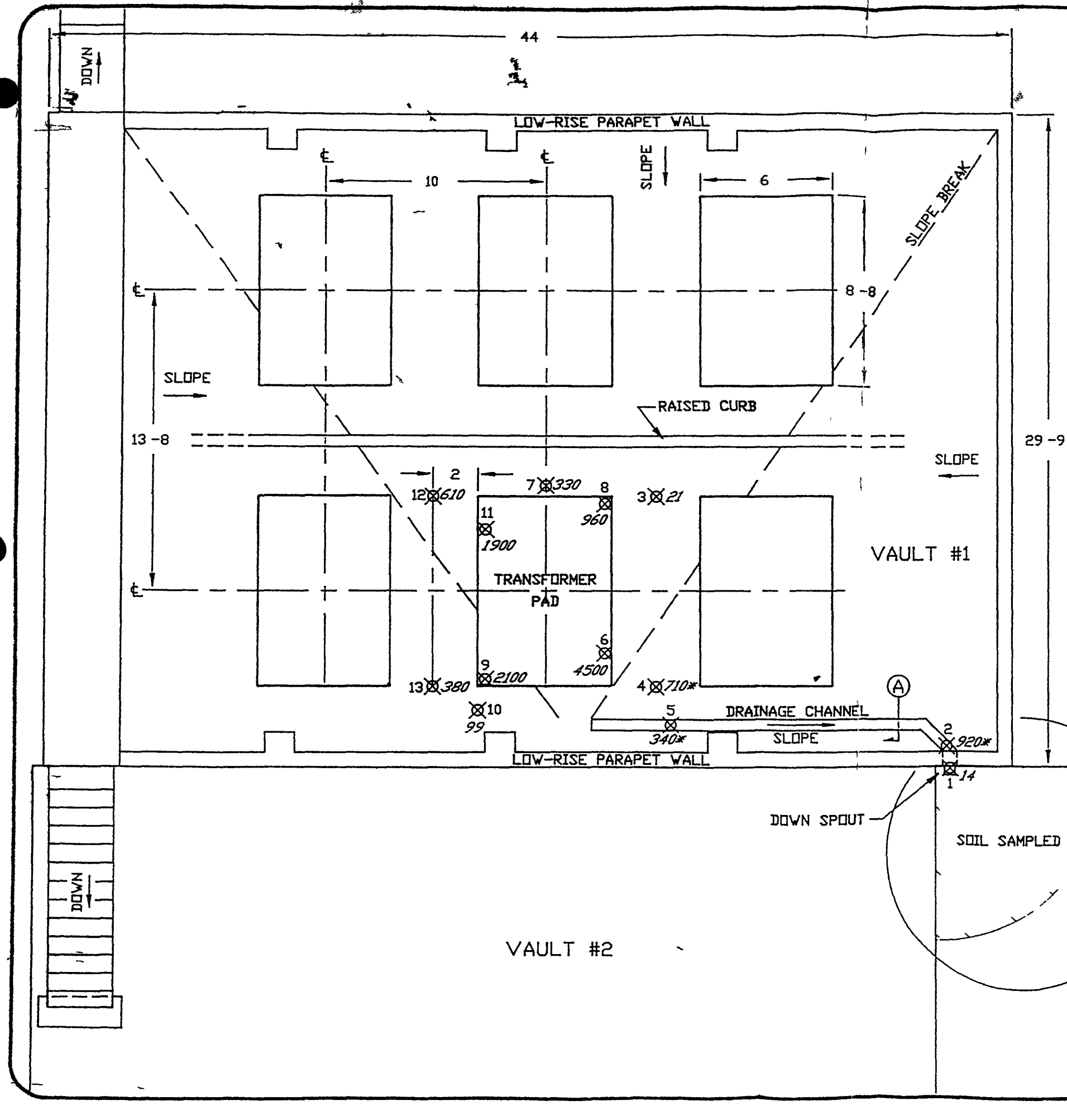
NOTICE

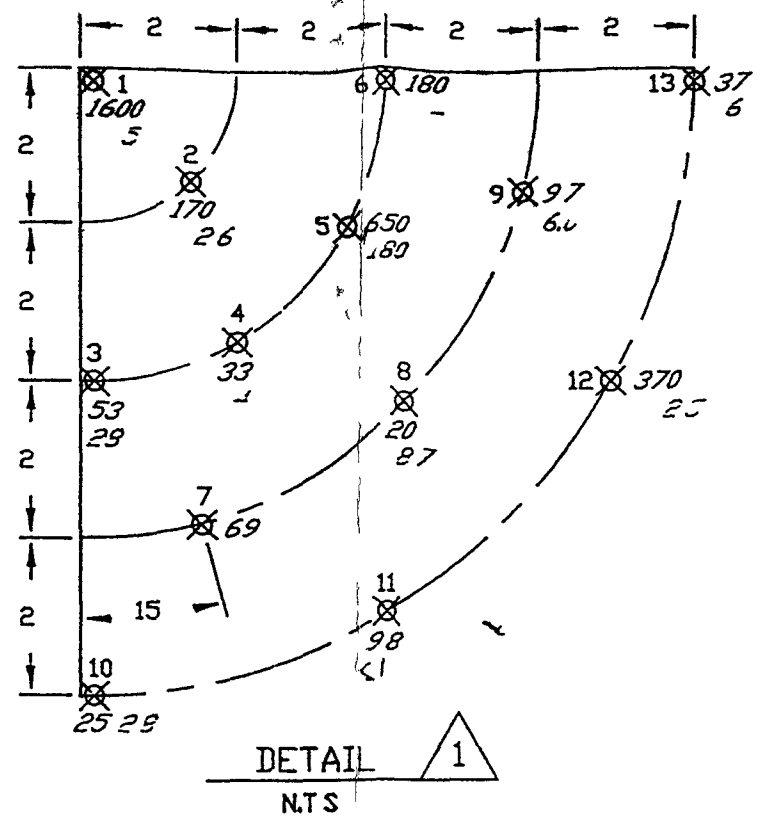
This document (or documents) is oversized for 16mm microfilming, but is available in its entirety on the 35mm fiche card referenced below:

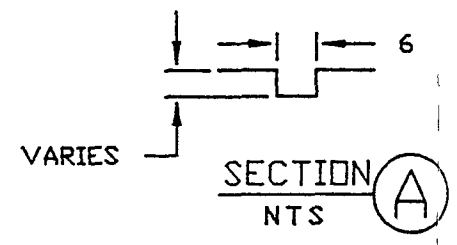
Document # 000305

Titled: Areas Potentially Contaminated with PCB's Plate 1 July 17, 1991

Fiche location: A-SW-M20

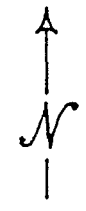




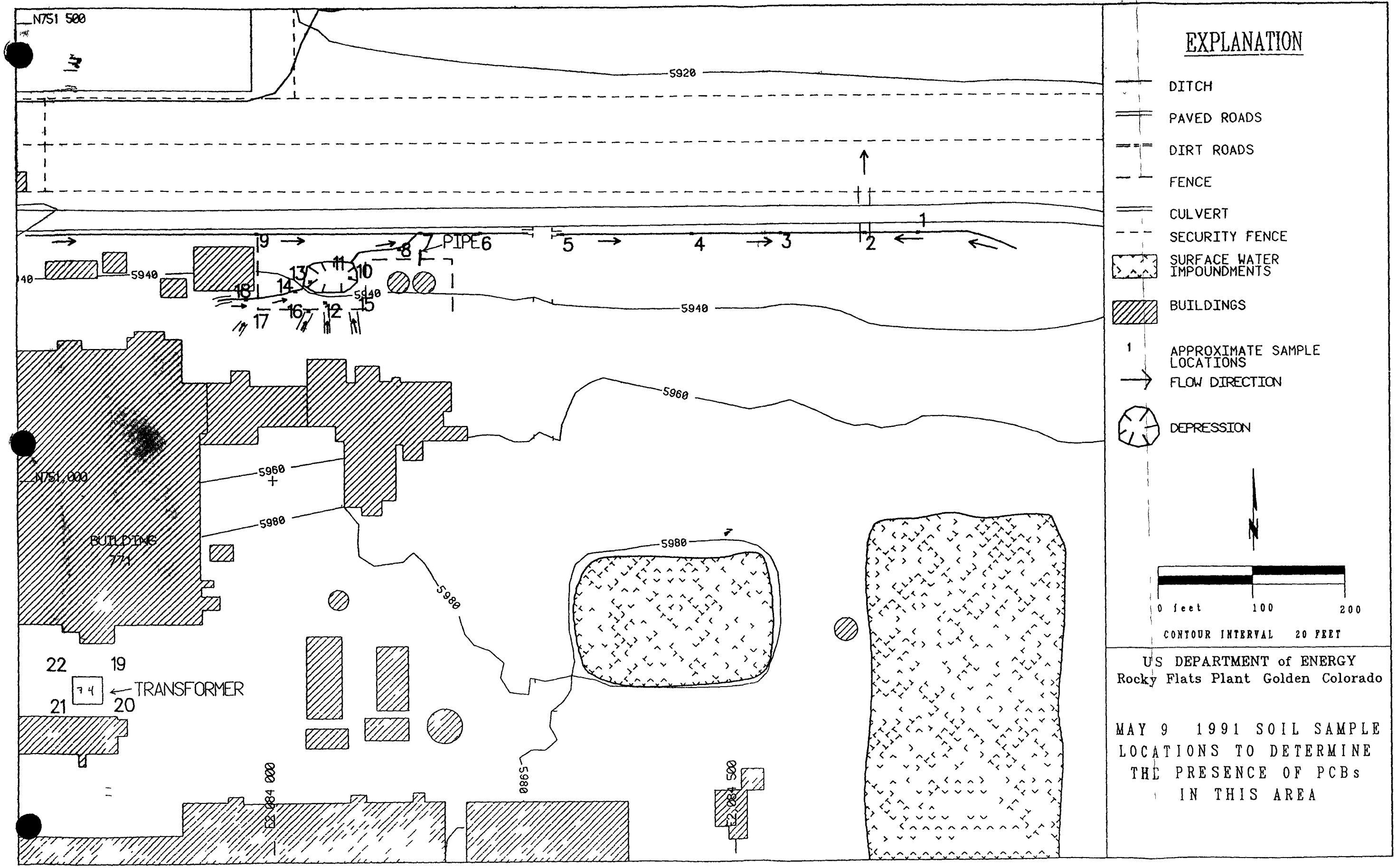


LEGEND

- 4 ⊗ — SAMPLE ID (NUMERIC SUFFIX) (IE) RF-W-④ OR RF-④
- ⊗ — SAMPLE POINT
- 710* — PCB CONCENTRATION - SURFACE (SOIL - PPM, WIPE - μg/100cm)
- 25 — PCB CONC (PPM) - 1.5 FT DEPTH
- *INDICATES AVERAGE VALUE OF REPLICATE ANALYSES



APTUS ENVIRONMENTAL SERVICES	
FILE	ROCK707R
DATE	4-16-91 REV #1
VIEW	PLAN & SECTION
DOCUM	SITE INV PH IA
SCALE	1IN = 5FT
PROJECT	ROCKY FLATS, BLG 707, ROOF - PCB
CLIENT	EG & G ROCKY FLATS, INCORPORATED
LOCATION	NORTH OF GOLDEN COLORADO
TITLE	SITE LAYOUT & SAMPLE RESULTS



US DEPARTMENT of ENERGY
Rocky Flats Plant Golden Colorado

MAY 9 1991 SOIL SAMPLE LOCATIONS TO DETERMINE THE PRESENCE OF PCBs IN THIS AREA

MAP LEGEND

- PAVED ROADS
- DIRT ROADS
- CONTOUR LINES
- STREAMS, DITCHES, DRAINAGE FEATURES
- SECURITY FENCE
- INDIVIDUAL HAZARDOUS SUBSTANCE SITES
- SURFACE WATER IMPOUNDMENTS
- 881 BUILDINGS
- 21 AREAS POTENTIALLY CONTAMINATED WITH PCBs (AREA NOT TO SCALE)

0 feet 200 400 600

CONTOUR INTERVAL = 20 FEET

U.S. DEPARTMENT
of
ENERGY
GOLDEN, COLORADO

AREAS POTENTIALLY CONTAMINATED WITH PCBs

PLATE 1

JULY 17, 1991

NO.	DATE	REVISION